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5.1 ELECTRICAL SYSTEM DESCRIPTION

Incoming AC power is supplied to an electrical panel located at the front of the insert head, and also each pair of stations. A switch mode power supply on the back of the panels supplies 36VDC and 8VDC to distribution PCBs located on the front of the panels, which then supply these outputs to the various parts of the machine. Other PCBs are also located on the electrical panels and elsewhere on the machine. PCB descriptions follow further in this section.

Communication between the PC and CPU PCBs is via a Controller Area Network (CAN) allowing simple twisted pair connection operating with a unique protocol. The system has high immunity to noise and provides error-free communication at up to 1Mbit/sec. It is widely used in industrial control applications.

DC hybrid motors are used to drive the turnover, feeders, folders, collator, Hi/Std Cap feeders and diverter. They are connected to a module PCB for their power.

The electrical panels are shown below and opposite:

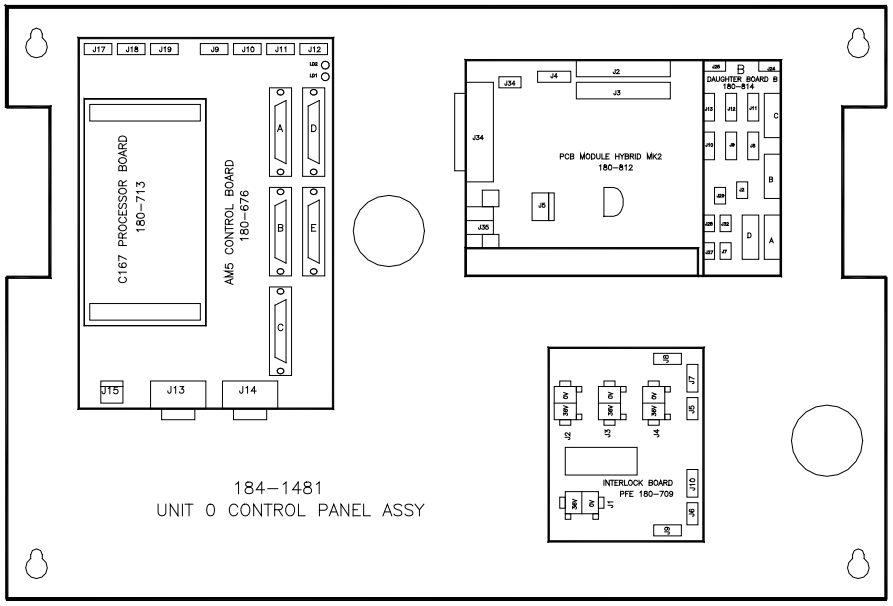


Fig. 1
Insert Head Electrical Panel
(located below the Wetter/Closer)

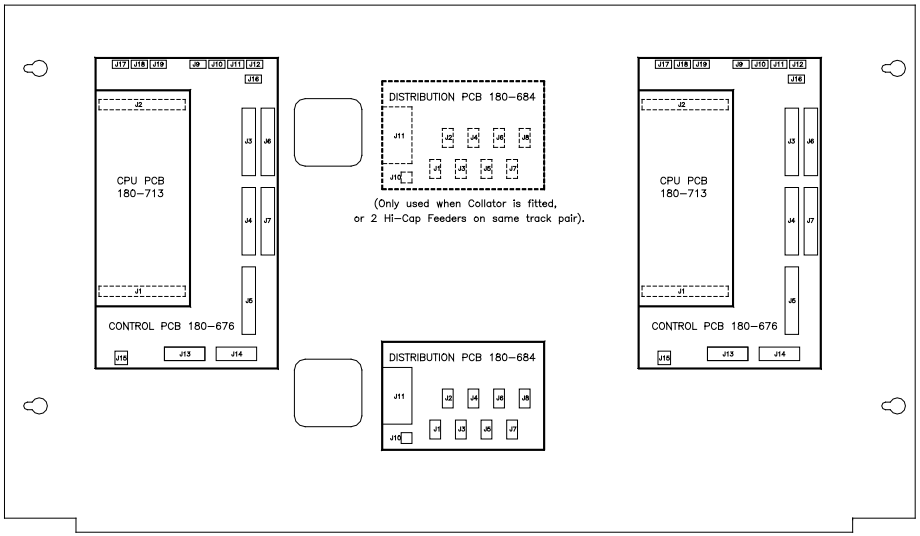


Fig. 2
Station Electrical Panel
(located in front of each pair of stations)

Important Note: An Add-On PSU assembly 184-156 which includes an additional Distribution PCB is used if a collator is fitted to any station, or if 2 Hi-Cap units are fitted together on the same station pair. The PSU is fitted to the rear of the panel with the Distribution PCB on the front, as shown above. See also section 5.23.

PCB Description

A number of different PCB types are used on the machine, listed below:

Control PCB	180-676
CPU PCB	180-713 (Part of Control PCB)
Dual Distribution PCB	180-808
Module PCB	180-811 & 180-812
Daughterboard A	180-813
Daughterboard B	180-814
Daughterboard C	180-815
Daughterboard D	180-816

Note: Daughterboards A to H are mounted on Module PCBs and take the place of separate Splitter PCBs.

cont.

PCB Description (contd.)

Daughterboard E	180-817
Daughterboard F	180-818
Daughterboard G	180-819
Daughterboard H	180-820
Stepper PCB	180-675
Ribbon Splitter 1	180-691
Wetter PCB	180-702
Disc Sensor PCB	180-689
Vane Sensor PCB	180-692
Overflow PCB	180-714
Interlock PCB	180-709
Mains Delay PCB	180-710

Note: Daughterboards A to H are mounted on Module PCBs and take the place of separate Splitter PCBs.

Note: Mains Delay PCB is part of Mains Delay Kit 184-159 and is used only for machines over 4 stations, ie. 1 off kit fitted to station pair 5 & 6, 1 off kit to stations 7 & 8 etc. Note also that DIP switch S1 on Mains Delay PCB must be set to correspond with the station pair that the PCB is fitted to, starting from 5/6 - ie. for station pair 5/6, set switch 1 to ON with remaining seven set to OFF, for station pair 7/8, set switch 2 to ON with remaining seven set to OFF and so on.

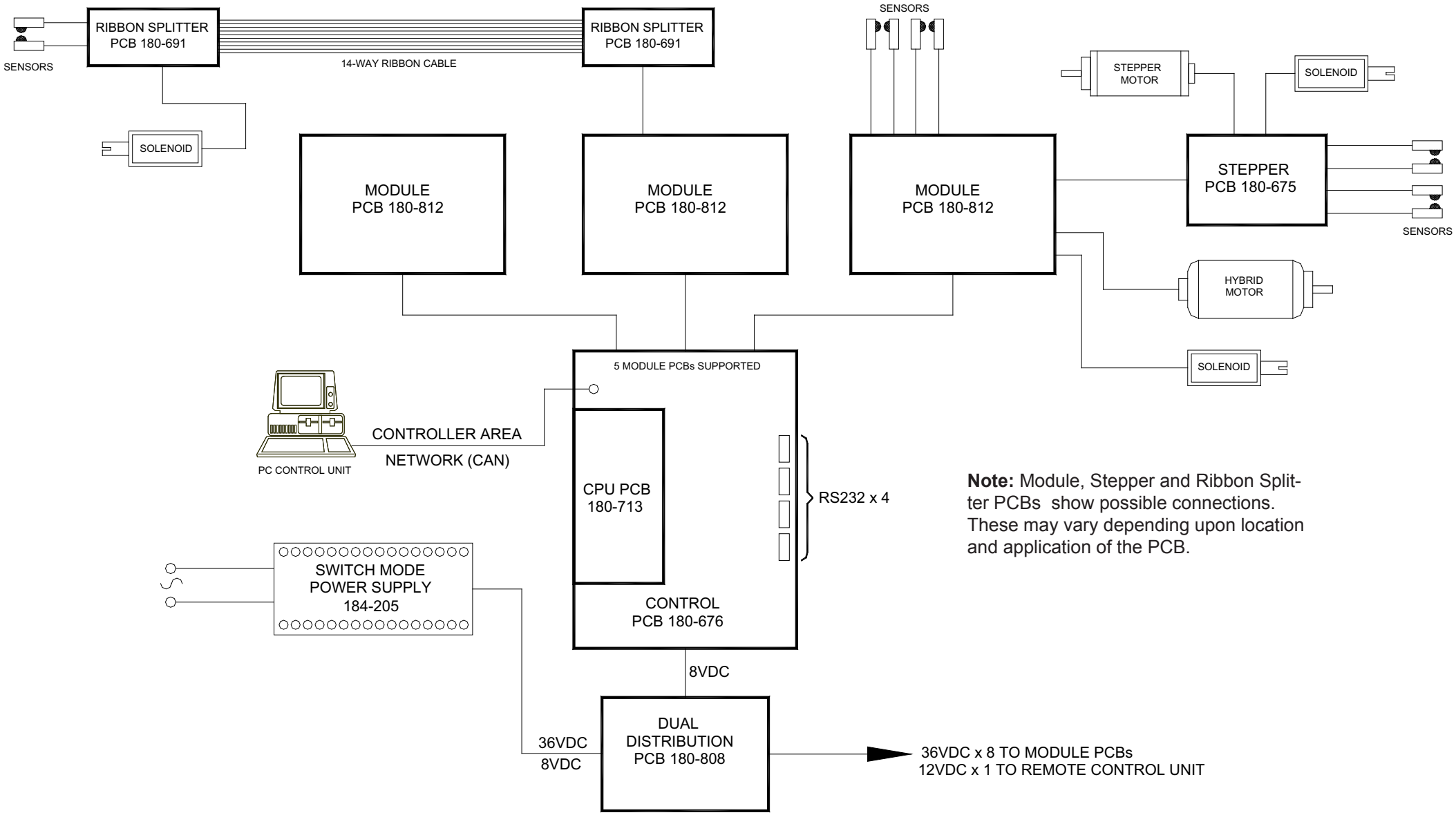
In addition there are 2 further PCBs used only in the Hi/Std Cap feeder or Diverter:

Hicap Motor PCB	180-701
Ribbon Splitter 2	180-704

The following PCB is used only when a barcode reading collator is fitted:

Barcode I/F PCB	180-711

A block diagram of PCB connectivity is shown on the following page.



Note: Module, Stepper and Ribbon Splitter PCBs show possible connections. These may vary depending upon location and application of the PCB.

5.2 Electrical System Block Diagram

5.3 PCB DESCRIPTIONS

Control PCB 180-676

Provides interfacing and connections between the machine and the CPU PCB, and also supplies the CPU with power. It provides connections for the module PCBs (up to five), and also has four serial inputs used for testing purposes. The control PCBs are mounted on the insert head and station electrical panels (see Figs.1 & 2).

CPU PCB 180-713

Processes information received and transmitted through the control PCB. It is located on connectors on the control PCBs, mounted on the electrical panels (see Figs. 1 & 2).

Module PCB 180-811 (without heatsink), 180-812 (with heatsink)

Provides control outputs for stepper PCBs (up to two), solenoids (up to eight) and one hybrid DC motor. It also has inputs for six adjustable sensors (TX/RX pairs) and six on/off sensors (TX/RX pairs). It is supplied with 36VDC from the distribution PCB via the interlock PCB. 5v for circuitry is supplied by the control PCB via the comms lead. A module PCB is fitted to the insert head electrical panel (see Fig. 1), and also to the folder, feeder, Hi/Std Cap feeder, collator and diverter modules. The module PCB on the electrical panel is connected to the turnover and wetter/closer modules.

Dual Distribution PCB 180-808

Takes DC input from the switch mode power supply (fitted on the back of each electrical panel) and distributes outputs as follows: 8 x 36VDC outputs (fused at 10A), 2 x 8VDC outputs and 1 x 12VDC output. Provides power to control PCB (8VDC), module PCBs (36VDC) and the remote control receiver (12VDC). The distribution PCB is mounted on the electrical panels (see Figs. 1 & 2).

Stepper PCB 180-675

Provides power to one stepper motor and also has inputs for four adjustable sensors (TX/RX pairs) and two on/off sensors (TX/RX pairs). It is connected to the module PCB which supplies its power. Each stepper motor on the machine has one stepper PCB, and these are fitted to the kicker (2 off), turnover eject, handover, shuttle, track cassettes and collator.

Interlock PCB 180-709

Interlocks for some modules, eg. feeders, can safely be controlled by software. Other, more safety-critical modules are hard-wired through the Interlock PCB for added protection and would operate even in the event of software failure. Mounted on the head electical panel and front edge of each station pair.

Ribbon Splitter PCB (180-691, 180-704 & 180-745)

This has no active components and serves to channel a number of separate sensor or solenoid/clutch connectors into one ribbon cable for convenient routing. This connects to another ribbon splitter which is then connected to a nearby module PCB using the separate connectors (note that in the case of Hi-Cap feeders, two of the Hi-Cap splitters A6 & A7 connect to the Hi-Cap motor PCB). It is also possible to 'daisy-chain' ribbon splitters.

Each ribbon splitter can connect three TX/RX sensor pairs and four solenoids (180-691), except for the Hi/Std Cap feeder, which can connect five TX/RX sensor pairs and two solenoids (180-704), and also the Feeder separator, which can connect five TX/RX sensor pairs and five solenoids (180-745)

Wetter PCB

This is used to monitor the fluid level sensors in the wetter tank. It is located at the front edge of the wetter/closer module.

cont.

5.4 LOCATIONS OF PCBS

Control/CPU, Interlock and Module PCBs are fitted on the insert head electrical panel (see Fig. 1). The Distribution and Hybrid E PCBs are fitted to the head PSU bracket (to the right of the electrical panel (one on each side). An Interlock PCB and Mains Delay PCB (when used) is fitted to the front edge of the station pair, as is a Module PCB for each station. The wetter PCB is fitted to the wetter/closer as described above. All other PCBs are fitted in various modules on the machine and are shown in the exploded views in this manual. The views that show them are referenced below:

Module PCB	Insert Head	Sect. 5.1
	Track Pair	Sect. 5.2
	Folder	Sect. 4c.5
	Feeder	Sect. 4c.1
	Flatbed Feeder	Sect. 4g.1
	Hi-Cap Feeder	Sect. 4c.9
	Std-Cap Feeder	Sect. 4c.41
	I.S. Collator	Sect. 4c.18
	Diverter	Sect. 4c.28
	Vertical Stacker	Sect. 4j.16
Stepper PCB	Shuttle	Sect. 4b.1
	Kicker	Sect. 4a.15
	Track Cassette	Sect. 4b.8
	Handover	Sect. 4a.8
	Turnover Eject	Sect. 4a.13
	I.S. Collator	Sect. 4.c.18
	Vertical Stacker	Sect. 4j.4
Ribbon		
Splitter PCB	Various locations - see all drawings	

Location and usages of Module PCBs

Module PCBs are identified by the letters A to E. They relate to different modules on the machine, and their usages and locations are described below:

Module PCB 'A' – Feeder. Located underneath. Also used on Hi-Cap or Std-Cap feeder, located on a plate at the front, accessed from the rear.

Module PCB 'B' – Folder. Located on front of unit.

Module PCB 'C' – Handover. Located on side of Envelope Opener, adjacent to Handover Unit. Also used on Collator, located on LH side.

Module PCB 'D' – Turnover and Wetter/Closer. Located on Insert Head Electrical Panel (see page 3).

Module PCB 'E' – Kicker. Located on chassis to left of kicker. Also on track pairs on front of chassis.

5.5 MOTORS, SOLENOIDS, MICROSWITCHES & FUSES

Hybrid & Parvalux Motors

The hybrid motors fitted to the machine are used for main drive purposes. They are 36VDC items, and incorporate an encoder (tacho) to provide feedback to the software, so allowing timing operations to take place. There are two types fitted, all but one used and shown in the exploded views as follows:

Turnover	Sect. 4a.11
Feeders	Sect. 4c.1
Folder	Sect. 4c.5
Collator	Sect. 4.c.18
Hi Cap Feeder	Sect. 4c.9
Std Cap Feeder	Sect. 4.c.39

The remaining type is used and shown in the exploded view as follows:

Wetter/Closer	Sect. 4a.18

The Hi Cap Feeder is also fitted with a 24v Parvalux motor for the hopper lift. This connects to the Wetter PCB and is shown in the exploded view as follows:

Hi Cap Feeder	Sect. 4c.9

Stepper Motors

There are three types of stepper motor used on the machine and can be located in the exploded views as follows:

Double-ended stepper motor:

Turnover	Sect. 4a.11

3-stack stepper motor:

Handover	Sect. 4a.8
Shuttle	Sect. 4b.1
T/over Eject Kicker	Sect. 4a.13
Kicker	Sect. 4a.15
Track Cassette	Sect. 4b.8

1-stack stepper motor:

Kicker	Sect. 4a.14

DC Motors

Small DC (not hybrid) drive motors are used on the feeder for powering the separator, and also providing drive to the feeder conveyor and feeder interface. They are also used with a cast gearbox for powering fold plates and backstops. They can be located in the exploded views as follows:

Feeder (separator)	Sect. 4c.3
Feeder (conveyor drive)	Sect. 4c.1
Folder	Sect. 4c.5
Shuttle Bed	Sect. 4b.3
Hi-Cap (separator)	Sect. 4c.12

Solenoids

Solenoids used on the machine are 25mm STA types except for one used on the track cassette, which is a 19mm STA type. They can be located in the exploded views as follows.

Envelope Opener	Sect. 4a.1
Envelope Conveyor	Sect. 4a.4
Wetter/Closer	Sect. 4a.18
Track Cassette	Sect. 4b.8

Fuses

The mains supply of the machine is fitted with 30A & 10A 38mm cartridge fuses, These are located on the DIN rail at the rear of the head section and provide protection for the incoming mains (30A) and for all units on the machine (10A). See fig. 3 on page 64 for locations. Part numbers are:

30A	135-430
10A	135-410

The Distribution PCB is also fitted with on-board 10A fuses, part number 135-317UL. The PCBs are located at the front of the head section and each track station (see figs. 1 & 2 on page 3).

5.6 LOCATIONS OF SENSORS

There are two types of sensor used on the machine, namely receiver/emitter optical pairs and flag or disc sensors, which contain the receiver & emitter in one block. The optical pairs may be used as adjustable sensors, (eg. for double document detection where the opacity of the paper will affect the output), or as on/off sensors (eg. for hold points).

Due to the large quantity of sensors used, it is not practical to show the physical location of all on a single view, so each may be found separately on the exploded view showing its actual position. Each sensor and its corresponding location is indicated on the following pages. **Note that the sensor name shown is used uniformly throughout, on exploded views, circuit diagrams and in software.**

For each sensor, its part number, physical location and the wiring diagram on which it appears is shown. The part number refers to the sensor and cable assembly, including connector, as far back as the PCB to which it connects. An exception to this is disc sensors which consist of a small PCB holding the forked sensor, and a separate cable; the nimber shown is the PCB number.

In the majority of cases, the sensors connect to a splitter PCB, but some connect directly to a stepper or module PCB, or to the daughterboard located on the module PCB.

See also page 7 for locations and usages of Module PCBs.

FEEDER	Part No.	Location	Wiring
FEED HOLD POINT (RX)	182-444	Sec. 4c.1	5.38
FEED HOLD POINT (TX)	182-443	Sec. 4c.1	5.38
FEED DOUBLE DOC (RX)	182-442	Sec. 4c.1	5.38
FEED DOUBLE DOC (TX)	182-443	Sec. 4c.1	5.38
FEED DESKEW (RX)	182-444	Sec. 4c.1	5.38
FEED DESKEW (TX)	182-443	Sec. 4c.1	5.38
OVERGUIDE FLAG	180-776	Sec. 4c.1	5.38
SEPARATOR SHIELD	180-691	Sec. 4c.1	5.38
SEPARATOR GAP	180-691	Sec. 4c.1	5.38
FEEDER COVER SWITCH	182-418	Sec. 4c.1	5.38
ENVELOPE MODULE			
ENVELOPE HOLD POINT 1 (RX)	182-444	Sec. 4a.1	5.32
ENVELOPE HOLD POINT 1 (TX)	182-440	Sec. 4a.1	5.32
ENVELOPE HOLD POINT 2 (RX)	182-441	Sec. 4a.1	5.32
FLAP DETECT (RX)	182-445	Sec. 4a.1	5.32
FLAP DETECT (TX)	182-443	Sec. 4a.1	5.32
NO FLAP DIVERT (RX)	182-444	Sec. 4a.1	5.32
NO FLAP DIVERT (TX)	182-443	Sec. 4a.1	5.32
ENVELOPE ENTRY (RX)	182-441	Sec. 4a.1	5.32
ENVELOPE ENTRY (TX)	182-440	Sec. 4a.1	5.32
HANDOVER			
ENVELOPE HOLD POINT 2 (TX)	182-443	Sec. 4a.8	5.32
INSERT IN POSITION (RX)	182-445	Sec. 4a.8	5.32
HANDOVER CLOCK	180-689	Sec. 4a.8	5.32
HANDOVER INDEX (RX)	182-441	Sec. 4a.8	5.32
HANDOVER INDEX (TX)	182-437	Sec. 4a.8	5.32
KICKER			
INSERT IN POSITION (TX)	182-443	Sec. 4a.15	5.33
ENVELOPE FLAP (TX)	182-443	Sec. 4a.15	5.33
INSERT BACKSTOP HOME FLAG	180-692	Sec. 4a.15	5.33
INSERT BACKSTOP MOTOR CLOCK	182-689	Sec. 4a.15	5.33
INSERT FINGERS FLAG	180-689	Sec. 4a.15	5.33
INSERT KICKER CLOCK	180-689	Sec. 4a.15	5.33
INSERT KICKER INDEX (RX)	182-442	Sec. 4a.15	5.33
INSERT KICKER INDEX (TX)	182-440	Sec. 4a.15	5.33

TURNOVER EJECT	Part No.	Location	Wiring
TURNOVER COMPLETE (TX)	182-440	Sec. 4a.11	5.34
TURNOVER EJECT CLOCK	180-689	Sec. 4a.11	5.34
TURNOVER EJECT INDEX (RX)	182-441	Sec. 4a.11	5.34
TURNOVER EJECT INDEX (TX)	182-440	Sec. 4a.11	5.34
TURNOVER			
ENVELOPE FLAP (RX)	182-439	Sec. 4a.11	5.34
TURNOVER COMPLETE (RX)	182-445	Sec. 4a.11	5.34
TURNOVER BACKSTOP CLOCK FLAG	180-692	Sec. 4a.11	5.34
ENVELOPE FLAP CLOCK FLAG	180-689	Sec. 4a.11	5.34
TURNOVER COVER SWITCH	182-333	Sec. 4a.11	5.34
WETTER CLOSER			
TANK DETECTOR	182-478	Sec. 4a.19	5.34
OVERFLOW REED SWITCH	182-675	Sec. 4a.19	5.34
CLOSER (RX)	182-441	Sec. 4a.18	5.34
CLOSER (TX)	182-443	Sec. 4a.18	5.34
EJECT (RX)	182-444	Sec. 4a.18	5.34
EJECT (TX)	182-443	Sec. 4a.18	5.34
WETTER COVER SWITCH	182-417	Sec. 4d.1	5.34
FOLDER			
FOLDER EXIT (RX)	182-444	Sec. 4c.5	5.37
FOLDER EXIT (TX)	182-443	Sec. 4c.5	5.37
FOLD PLATE 1 CLOCK FLAG	180-692	Sec. 4c.5	5.37
FOLD PLATE 2 CLOCK FLAG	180-692	Sec. 4c.5	5.37
FOLD PLATE 3 CLOCK FLAG	180-692	Sec. 4c.5	5.37
FOLD PLATE 1&3 MICROSWITCH	131-130	Sec. 4c.5	5.37
INSERT TRACK MODULE			
TOP TRACK (RX)	182-445	Sec. 4b.11	5.36
COVER SWITCH	182-494	Sec. 4d.7	5.36

SHUTTLE	Part No.	Location	Wiring
SHUTTLE (TX)	182-440	Sec. 4b.1	5.36
BOTTOM TRACK (TX)	182-440	Sec. 4b.1	5.36
TOP TRACK (TX)	182-440	Sec. 4b.1	5.36
HALF STEP (TX)	182-443	Sec. 4b.1	5.36
SHUTTLE CLOCK FLAG	180-689	Sec. 4b.1	5.36
SHUTTLE INDEX (RX)	182-438	Sec. 4b.1	5.36
SHUTTLE INDEX (TX)	182-440	Sec. 4b.1	5.36
TRACK CASSETTE			
BOTTOM TRACK (RX)	182-445	Sec. 4b.8	5.36
INSERT TRACK CLOCK FLAG	182-689	Sec. 4b.8	5.36
INSERT TRACK INDEX (RX)	182-445	Sec. 4b.8	5.36
INSERT TRACK INDEX (TX)	182-437	Sec. 4b.8	5.36
HALF STEP (RX)	182-442	Sec. 4b.8	5.36
SHUTTLE BED			
TRACKGUIDE CLOCKS	180-692	Sec. 4b.3	5.36
SHUTTLE (RX)	182-439	Sec. 4b.3	5.36
HI-CAP FEEDER			
FEEDER HOLD POINT SENSOR (RX)	182-441	Sec. 4c.9	5.39
FEEDER HOLD POINT SENSOR (TX)	182-440	Sec. 4c.9	5.39
FEEDER DOUBLE DOC SENSOR (RX)	182-438	Sec. 4c.9	5.39
FEEDER DOUBLE DOC SENSOR (TX)	182-440	Sec. 4c.9	5.39
FEEDER DESKEW (RX)	182-441	Sec. 4c.9	5.39
FEEDER DESKEW (TX)	182-440	Sec. 4c.9	5.39
EXIT (RX)	182-441	Sec. 4c.9	5.39
EXIT (TX)	182-440	Sec. 4c.9	5.39
STACK SENSOR (RX)	182-445	Sec. 4c.9	5.39
STACK SENSOR (TX)	182-443	Sec. 4c.9	5.39
TRAY DOWN SWITCH	182-479	Sec. 4c.9	5.39
SEPARATOR GAP CLOCK	180-691	Sec. 4c.9	5.39
TOP LIMIT SENSOR	182-502	Sec. 4c.14	5.39
OVER RUN SENSOR (RX)	182-445	Sec. 4c.9	5.39
OVER RUN SENSOR (TX)	182-443	Sec. 4c.9	5.39
TOP COVER REED SWITCH	182-580	Sec. 4c.9	5.39
BOTTOM LIMIT SENSOR	182-480	Sec. 4c.14	5.39
TROLLEY-IN REED SWITCH	182-494	Sec. 4c.9	5.39
MOTOR CLOCK SENSOR A	180-689	Sec. 4c.9	5.39
MOTOR CLOCK SENSOR B	180-689	Sec. 4c.9	5.39

ST-CAP FEEDER	Part No.	Location	Wiring
FEEDER HOLD POINT SENSOR (RX)	182-441	Sec. 4c.39	5.40
FEEDER HOLD POINT SENSOR (TX)	182-440	Sec. 4c.39	5.40
FEEDER DOUBLE DOC SENSOR (RX)	182-438	Sec. 4c.39	5.40
FEEDER DOUBLE DOC SENSOR (TX)	182-440	Sec. 4c.39	5.40
FEEDER DESKEW (RX)	182-441	Sec. 4c.39	5.40
FEEDER DESKEW (TX)	182-440	Sec. 4c.39	5.40
EXIT (RX)	182-441	Sec. 4c.39	5.40
EXIT (TX)	182-440	Sec. 4c.39	5.40
STACK SENSOR (RX)	182-445	Sec. 4c.39	5.40
STACK SENSOR (TX)	182-443	Sec. 4c.39	5.40
SEPARATOR GAP SENSOR	180-691	Sec. 4c.39	5.40
TOP COVER REED SWITCH	182-580	Sec. 4c.39	5.40
COLLATOR			
HOLD POINT 1 (RX)	182-445	Sec. 4c.18	5.43
HOLD POINT 1 (TX)	182-443	Sec. 4c.18	5.43
HOLD POINT 2 (RX)	182-445	Sec. 4c.18	5.43
HOLD POINT 2 (TX)	182-443	Sec. 4c.18	5.43
COLLATE POCKET (RX)	182-445	Sec. 4c.21b	5.43
COLLATE POCKET (TX)	182-443	Sec. 4c.21b	5.43
COLLATE EJECT (RX)	182-441	Sec. 4c.18	5.43
COLLATE EJECT (TX)	182-443	Sec. 4c.18	5.43
COLLATE TRACK PAWL (RX)	182-442	Sec. 4c.21b	5.43
COLLATE TRACK PAWL (TX)	182-443	Sec. 4c.21b	5.43
STEPPER CLOCK	180-689	Sec. 4c.21b	5.43
COLLATE COVER REED SWITCH	182-494	Sec. 4c.18	5.43
COLLATOR IN POSITION REED SWITCH	182-494	Sec. 4c.21	5.43
DIVERTER			
DIVERT ENTRY (RX)	182-444	Sec. 4c.28	5.44
DIVERT ENTRY (TX)	182-443	Sec. 4c.28	5.44
DIVERT EXIT (RX)	182-441	Sec. 4c.28	5.44
DIVERT EXIT (TX)	182-443	Sec. 4c.28	5.44
DIVERT 1 (RX)	182-441	Sec. 4c.28	5.44
DIVERT 1 (TX)	182-340	Sec. 4c.28	5.44
DIVERT 2 (RX)	182-344	Sec. 4c.28	5.44
DIVERT 2 (TX)	182-443	Sec. 4c.28	5.44
DIVERT COVER REED SWITCH	182-580	Sec. 4c.28	5.44

VERTICAL STACKER	Part No.	Location	Wiring
ENTRY (TX)	182-443	Sec. 4j.1	5.49
ENTRY (RX)	182-445	Sec. 4j.8	5.49
CONVEYOR DRIVE (TX/RX)	117-240	Sec. 4j.2	5.49
INPUT STEPPER INDEX (TX)	182-440	Sec. 4j.4	5.49
INPUT STEPPER INDEX (RX)	182-442	Sec. 4j.4	5.49
SIDE GUIDE (TX/RX)	182-761	Sec. 4j.8	5.49
SIDE GUIDE INDEX	180-691	Sec. 4j.5	5.49
SIDE GUIDE CLOCK	180-691	Sec. 4j.5	5.49
INPUT STEPPER CLOCK	180-689	Sec. 4j.4	5.49
WHEEL CLOCK	180-689	Sec. 4j.7	5.49
WHEEL INDEX (TX)	182-440	Sec. 4j.3	5.49
WHEEL INDEX (RX)	182-445	Sec. 4j.3	5.49

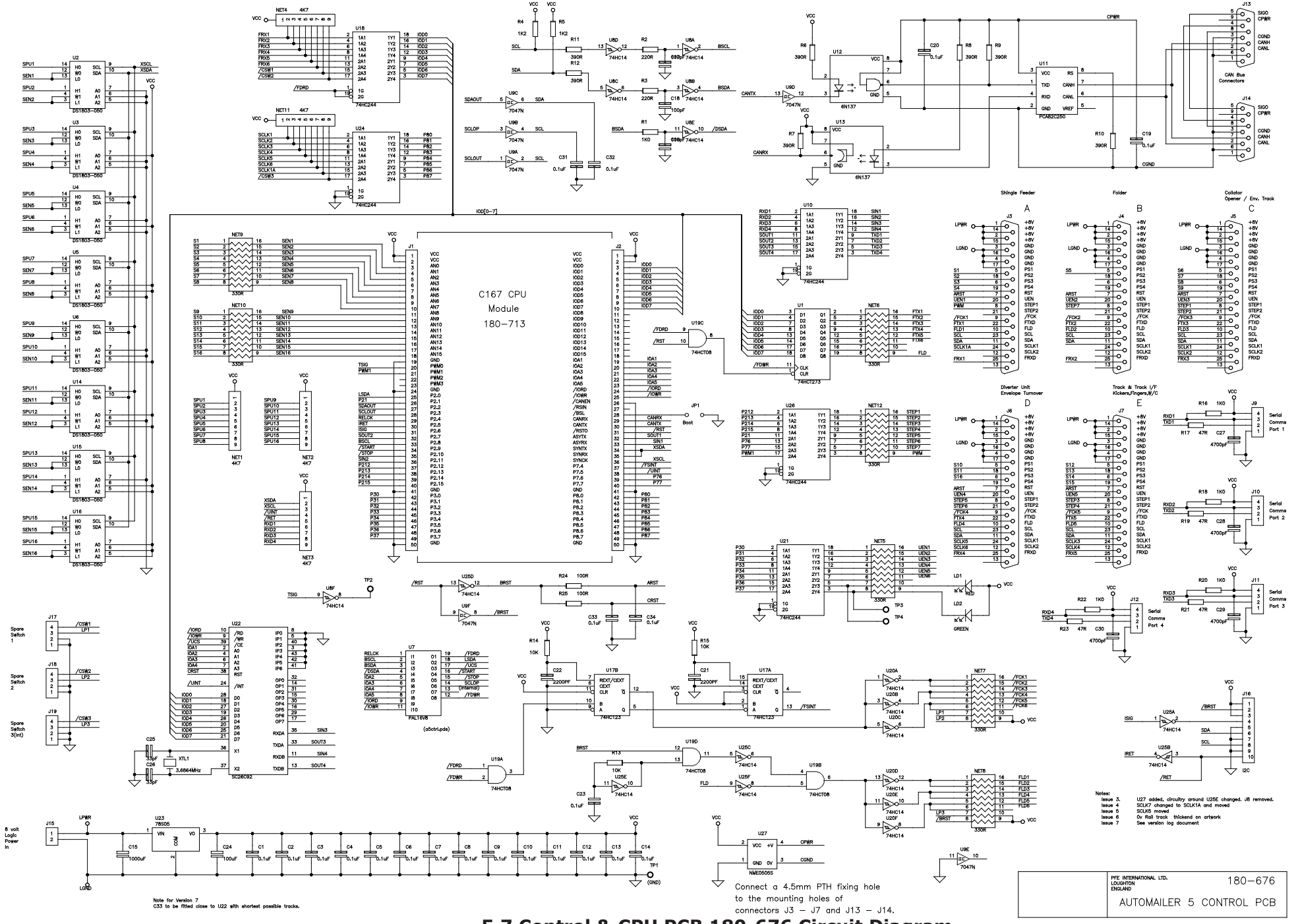
OMR/BARCODE READER	Part No.	Location	Wiring
OMR FOLDER EXIT(TX)	182-443	Sec. 4c.33	5.41
OMR FOLDER DESKEW (TX)	182-443	Sec. 4c.33	5.41
OMR FOLDER DESKEW (RX)	182-444	Sec. 4c.33	5.41
OMR FOLDER EXIT (RX)	182-341	Sec. 4c.33	5.41

FLATBED FEEDER MAIN ASSY	Part No.	Location	Wiring
EXIT(TX)	182-440	Sec. 4g.1	5.48

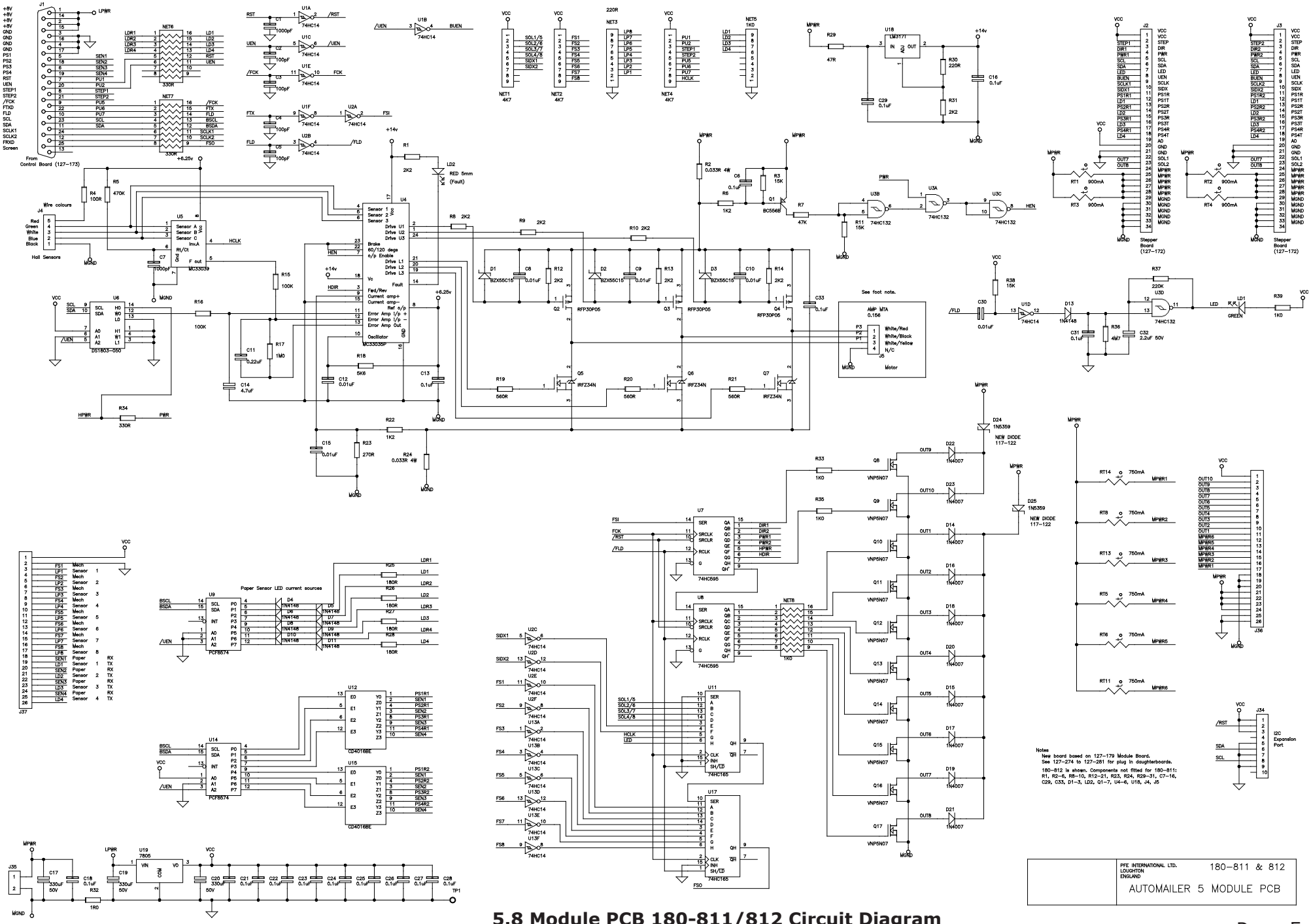
SEPARATOR (FB) ASSY	Part No.	Location	Wiring
SEPARATOR SHIELD	180-691	Sec. 4g.8	5.48
SEPARATOR GAP	180-691	Sec. 4g.8	5.48

FLATBED FEEDER CHASSIS ASSEMBLY	Part No.	Location	Wiring
OVERGUIDE FLAG	182-643	Sec. 4g.9	5.48
DESKEW (TX)	182-443	Sec. 4g.9	5.48
DOUBLE DOC (TX)	182-443	Sec. 4g.9	5.48
DOUBLE DOC (RX)	182-445	Sec. 4g.9	5.48
HOLD POINT (RX)	182-444	Sec. 4g.9	5.48
DESKEW (RX)	182-444	Sec. 4g.9	5.48
HOLD POINT (TX)	182-443	Sec. 4g.9	5.48
EXIT (RX)	182-445	Sec. 4g.9	5.48

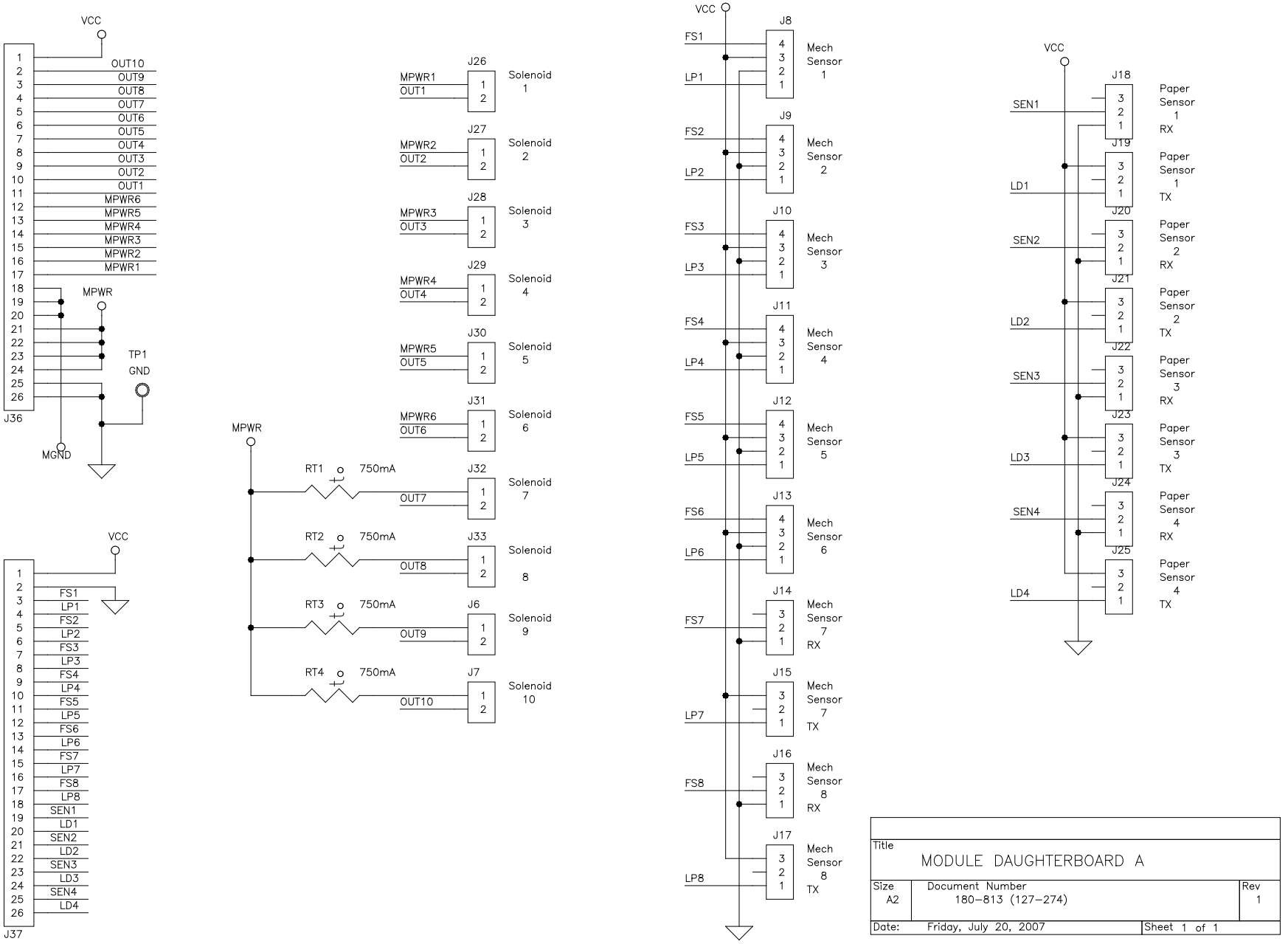
SINGLE ONLINE INTERFACE	Part No.	Location	Wiring
ENTRY (TX)	182-443	Sec. 4h.1	5.47
HOLD POINT 1 (RX)	182-444	Sec. 4h.1	5.47
HOLD POINT 2 (RX)	182-444	Sec. 4h.1	5.47
EXIT (RX)	182-445	Sec. 4h.1	5.47
ENTRY (RX)	182-444	Sec. 4h.1	5.47
HOLD POINT 1 (TX)	182-443	Sec. 4h.1	5.47
HOLD POINT 2 (TX)	182-443	Sec. 4h.1	5.47
EXIT (TX)	182-443	Sec. 4h.1	5.47



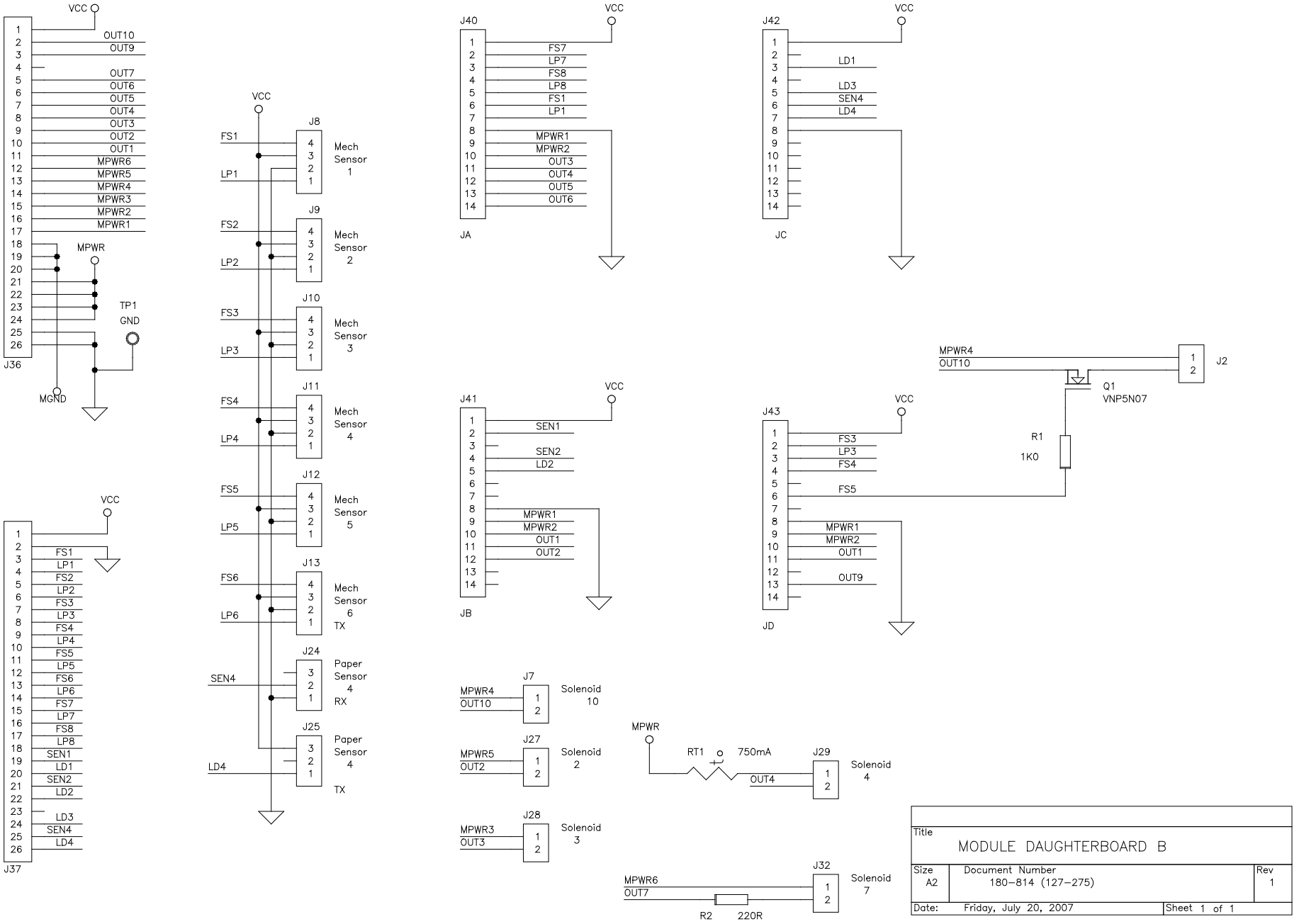
5.7 Control & CPU PCB 180-676 Circuit Diagram



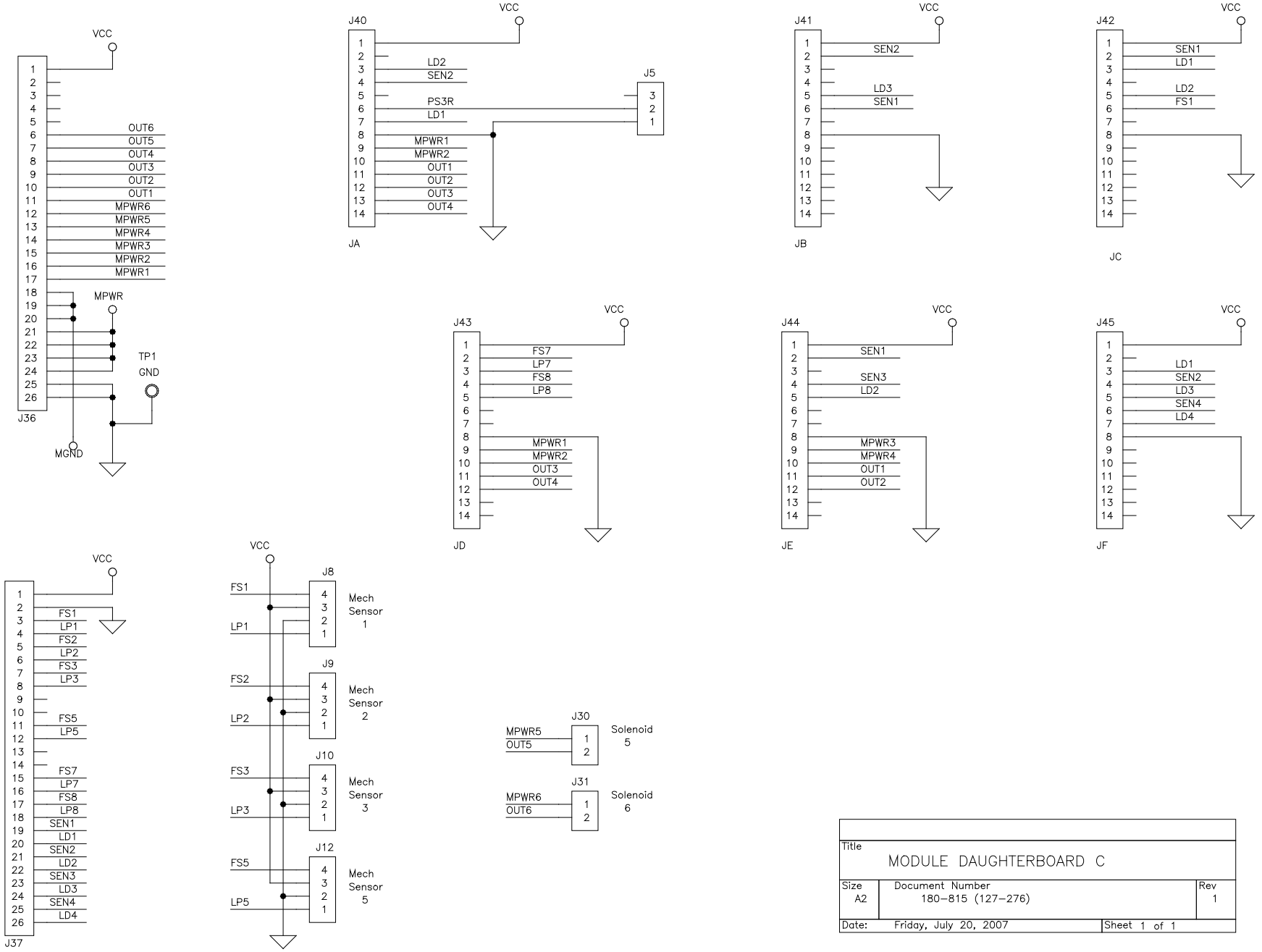
5.8 Module PCB 180-811/812 Circuit Diagram



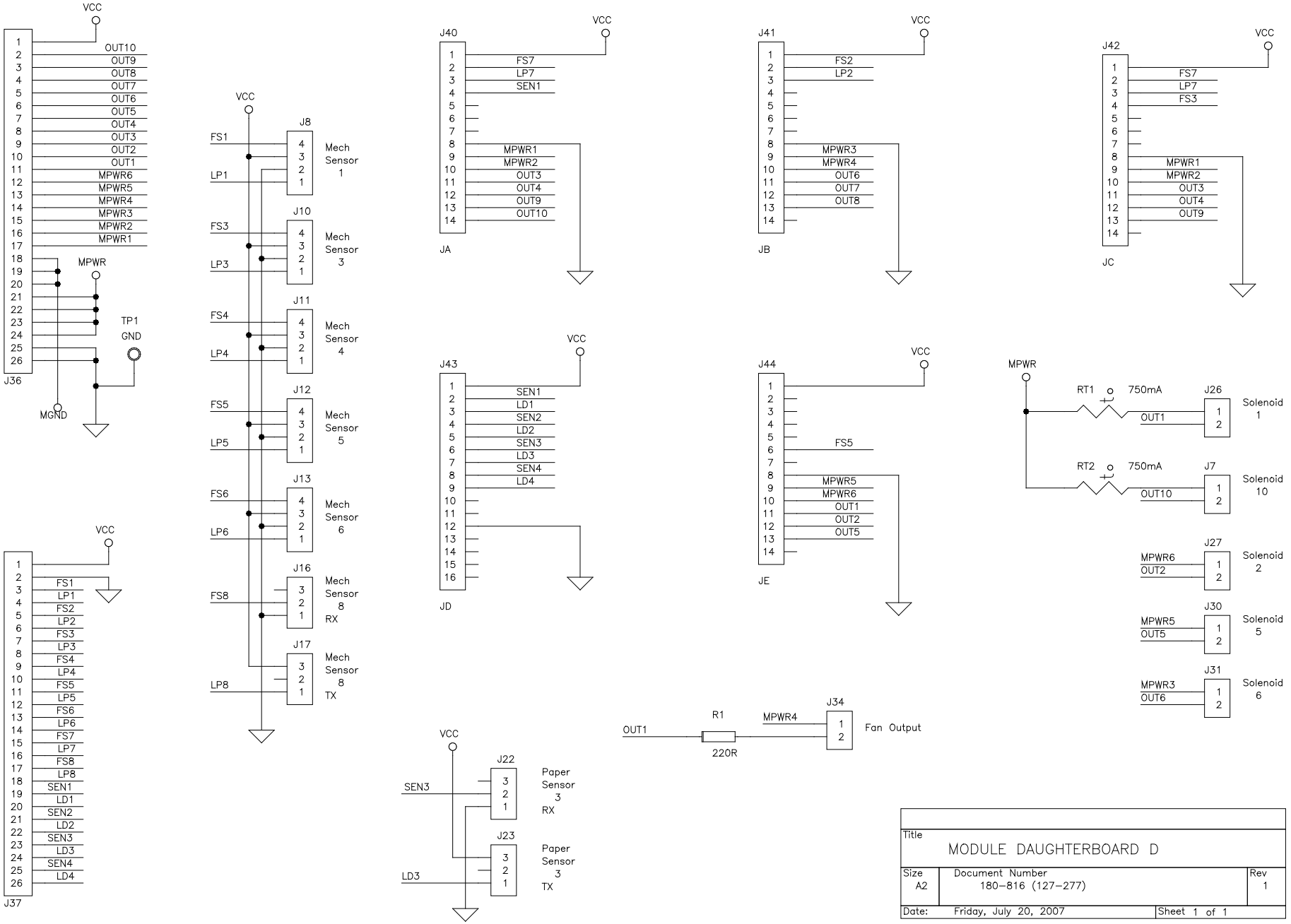
5.9 Module Daughterboard A 180-813 Circuit Diagram



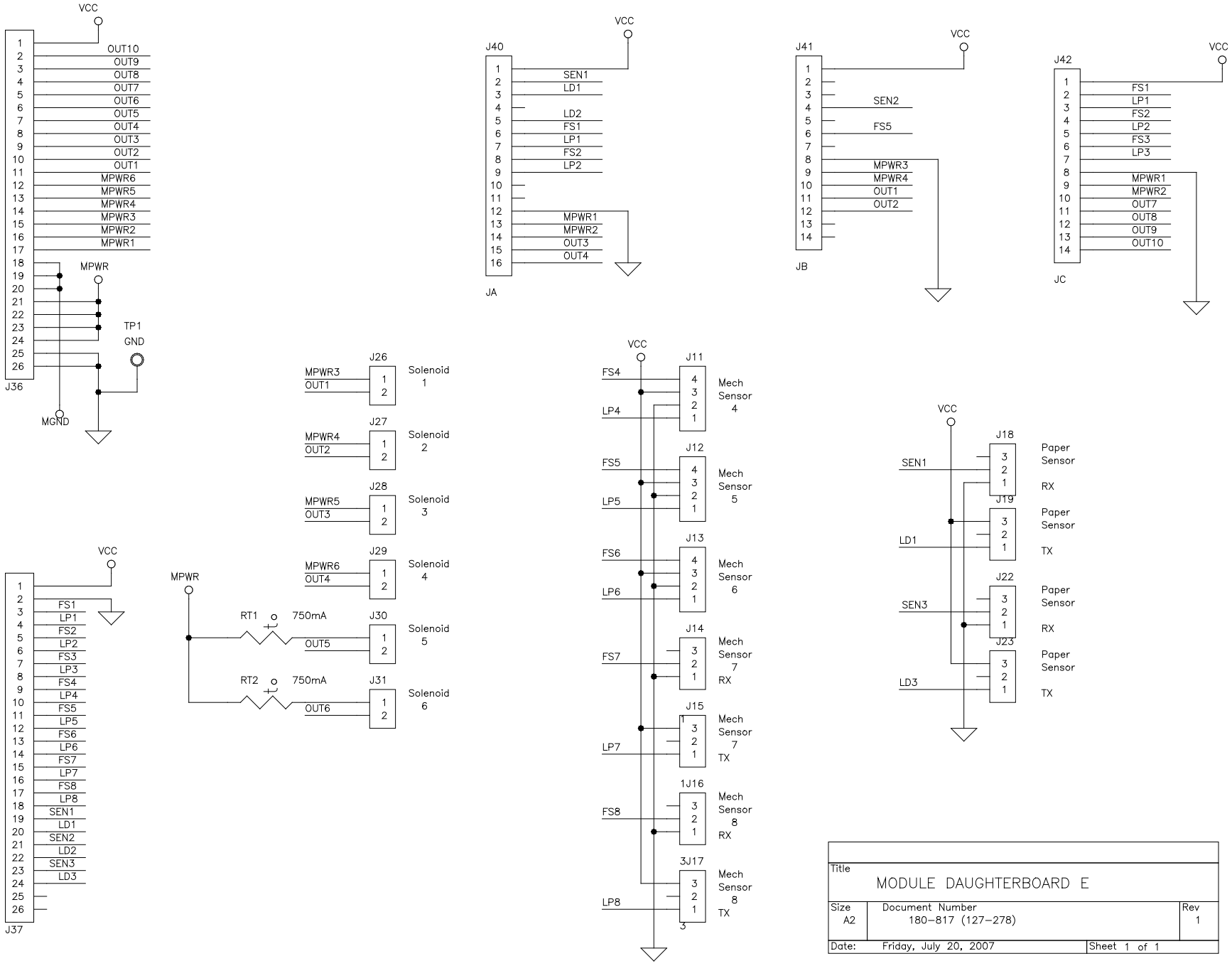
5.10 Module Daughterboard B 180-814 Circuit Diagram



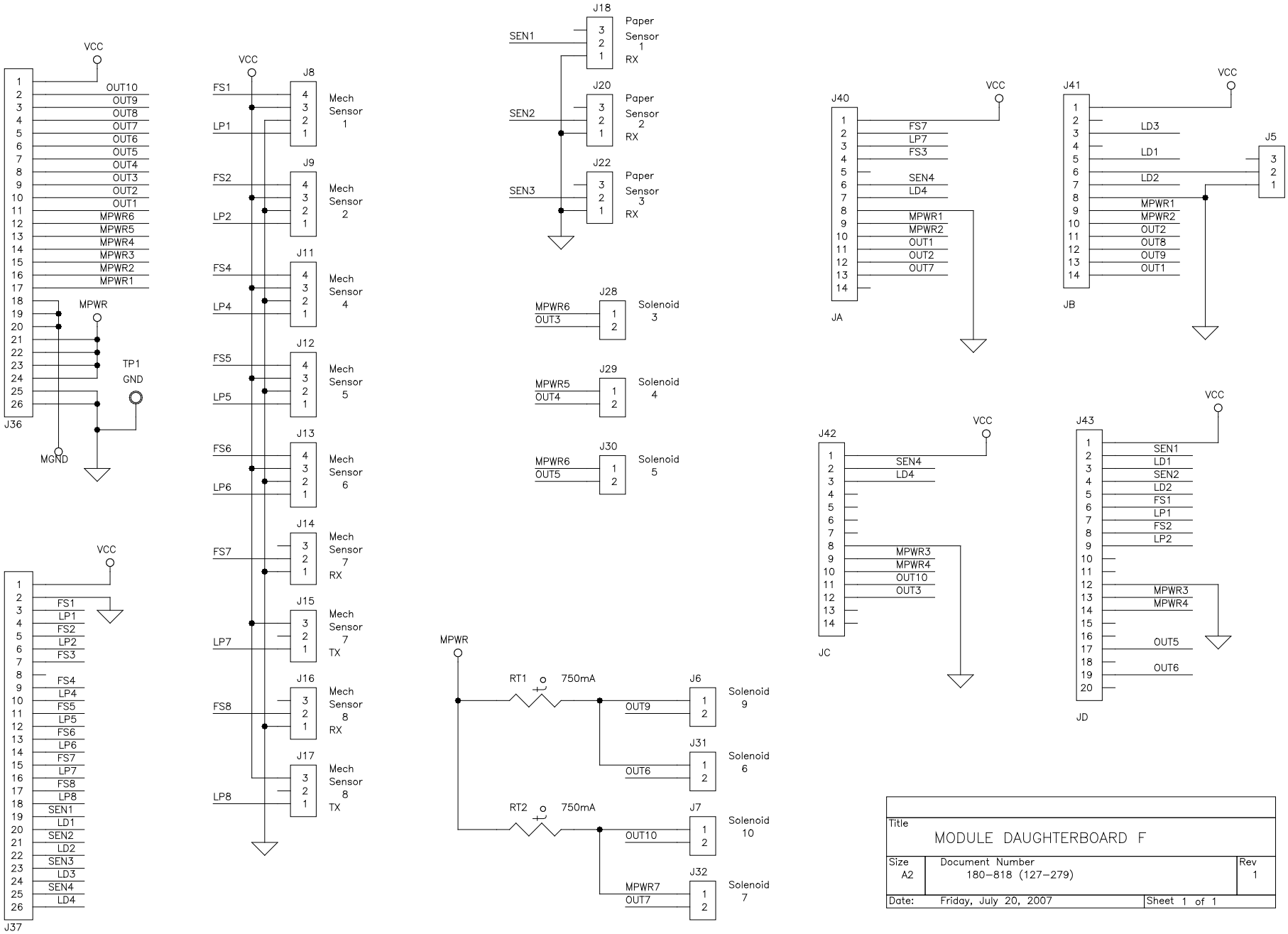
5.11 Module Daughterboard C 180-815 Circuit Diagram



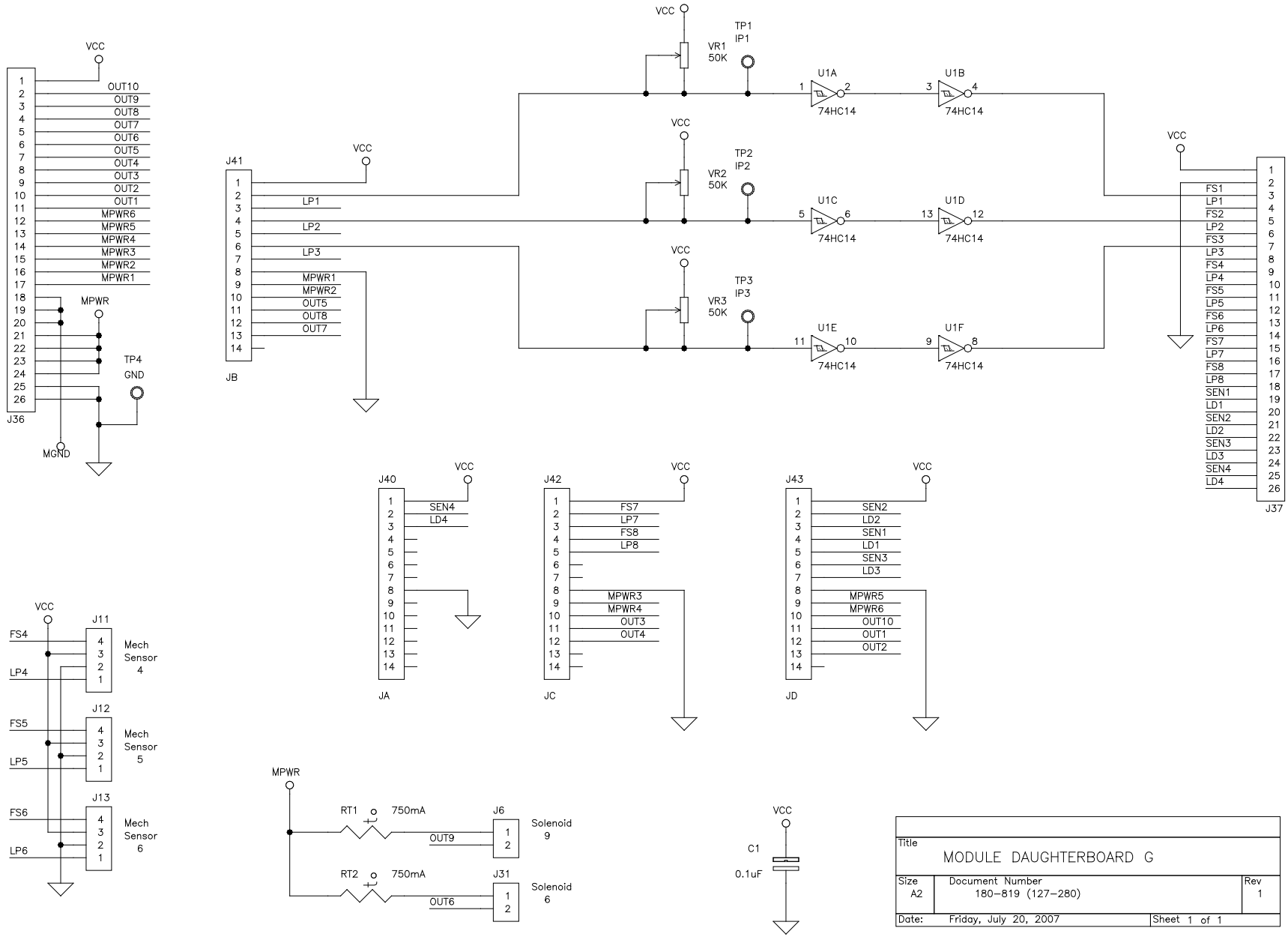
5.12 Module Daughterboard D 180-816 Circuit Diagram



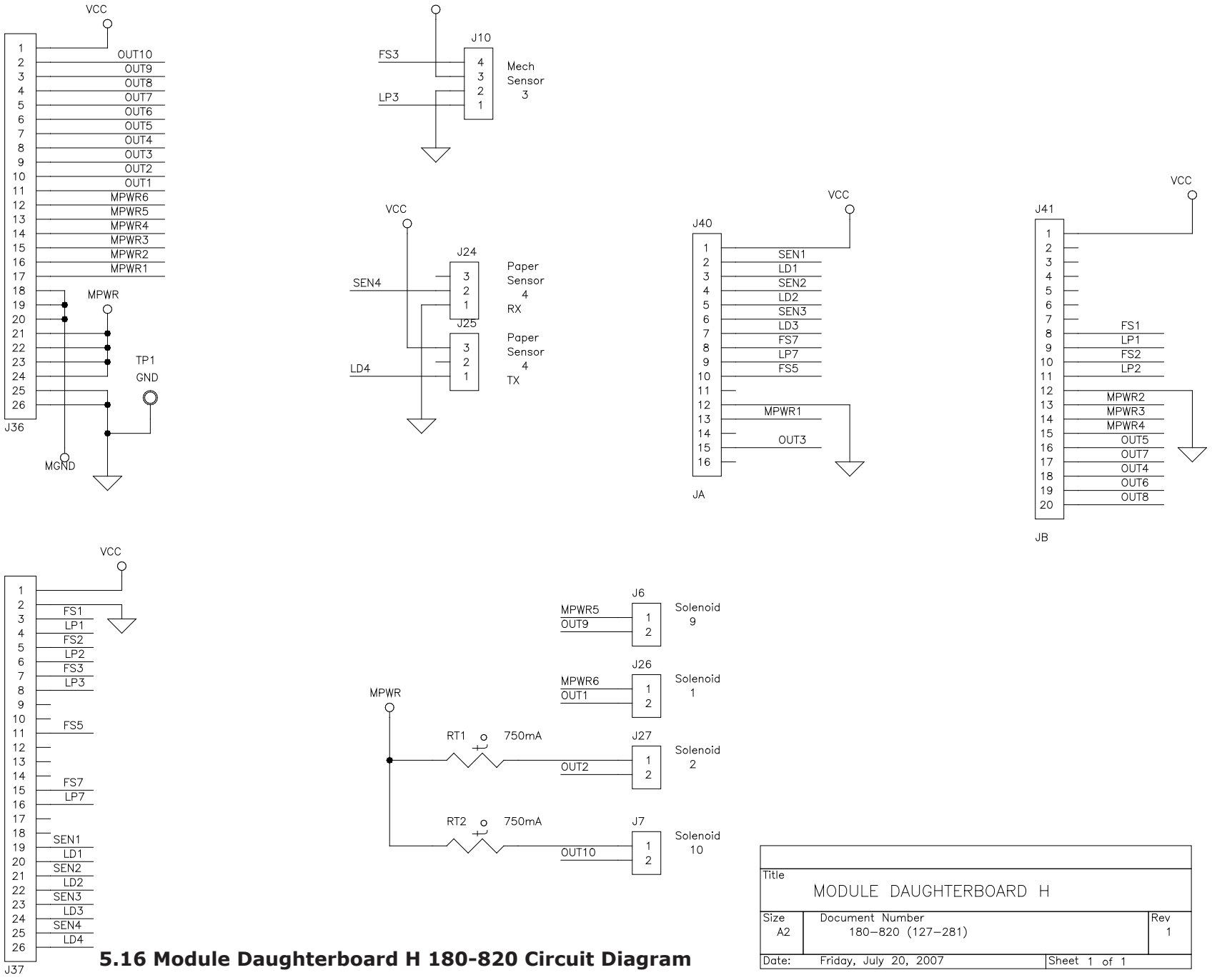
5.13 Module Daughterboard E 180-817 Circuit Diagram



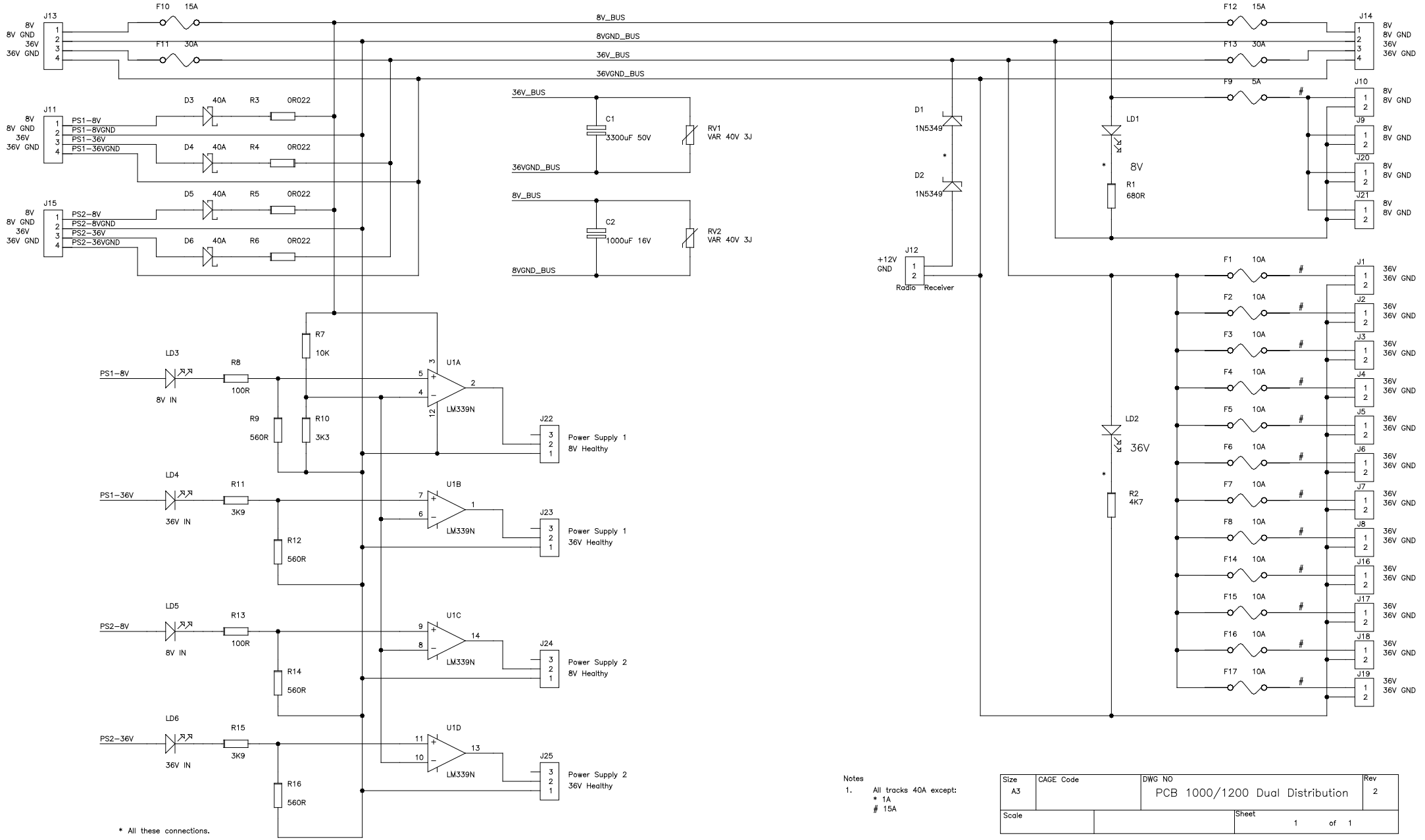
5.14 Module Daughterboard F 180-818 Circuit Diagram



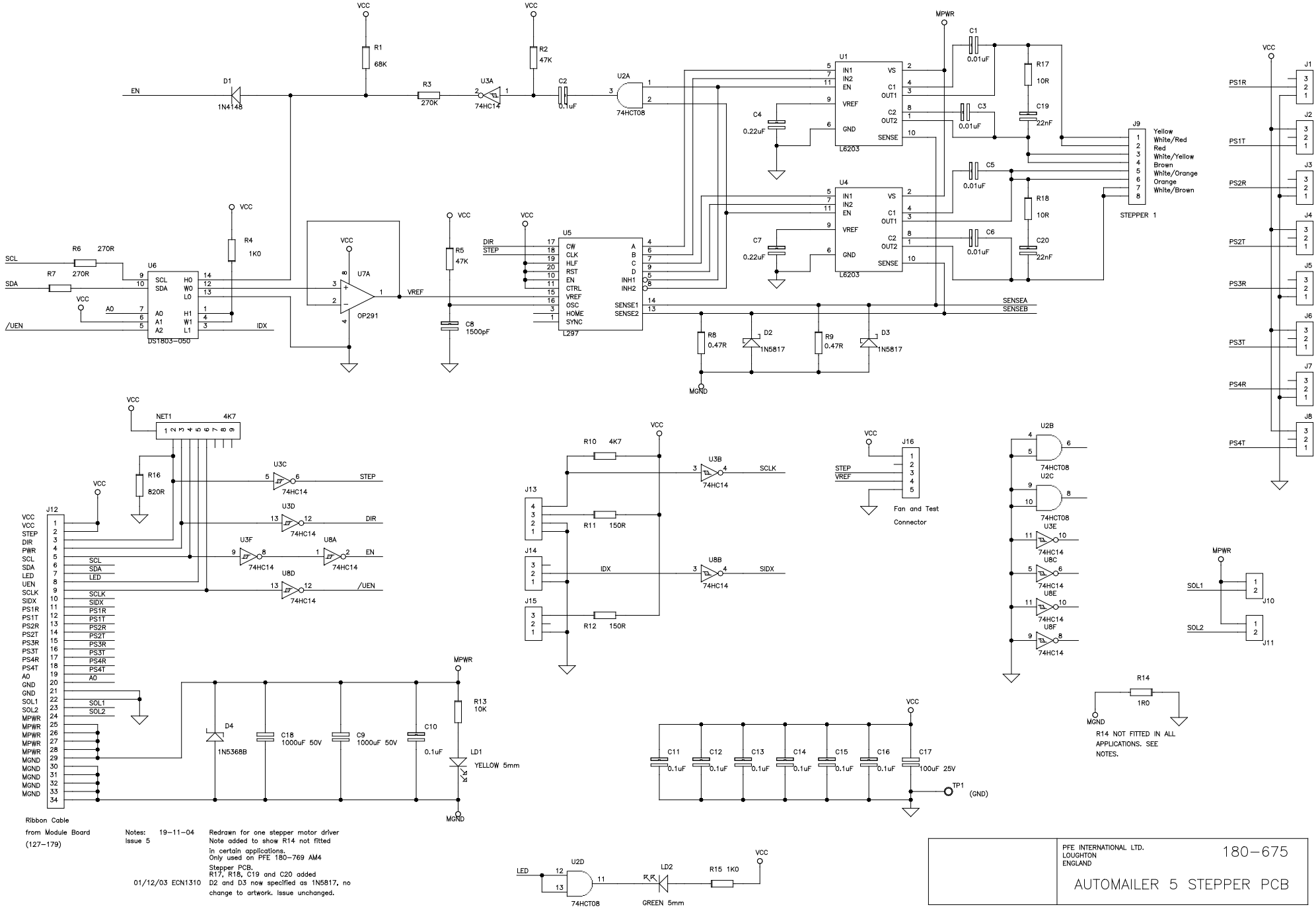
5.15 Module Daughterboard G 180-819 Circuit Diagram



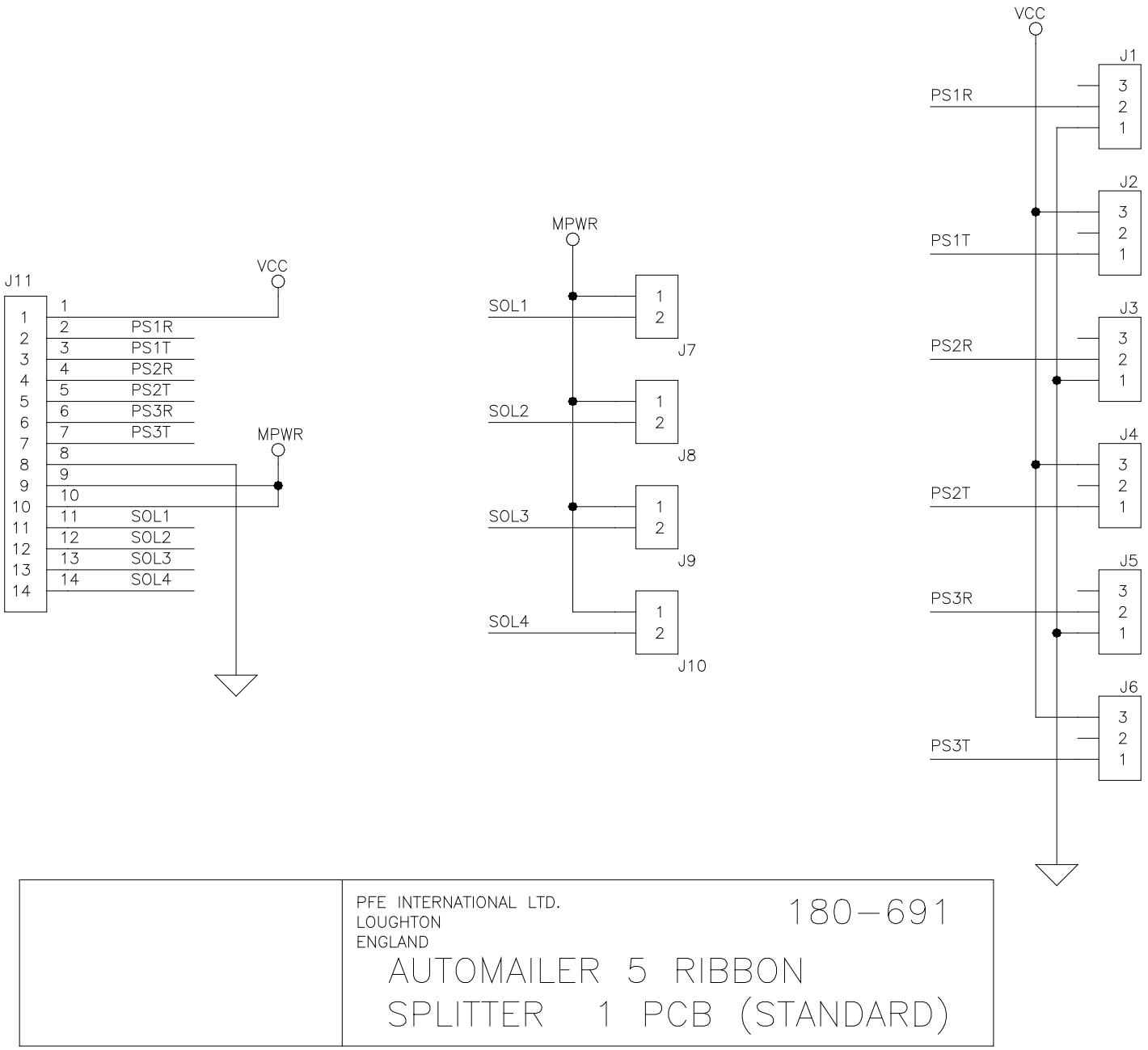
5.16 Module Daughterboard H 180-820 Circuit Diagram



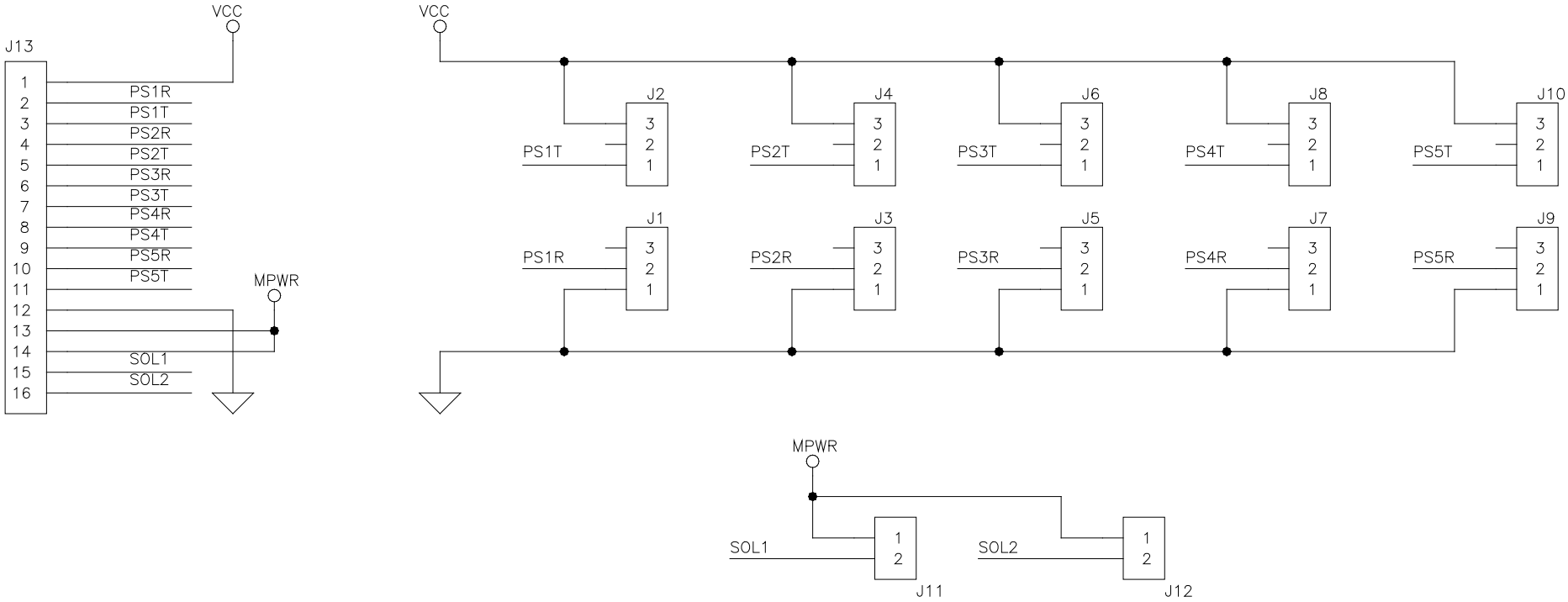
5.17 Distribution PCB 180-808 Circuit Diagram



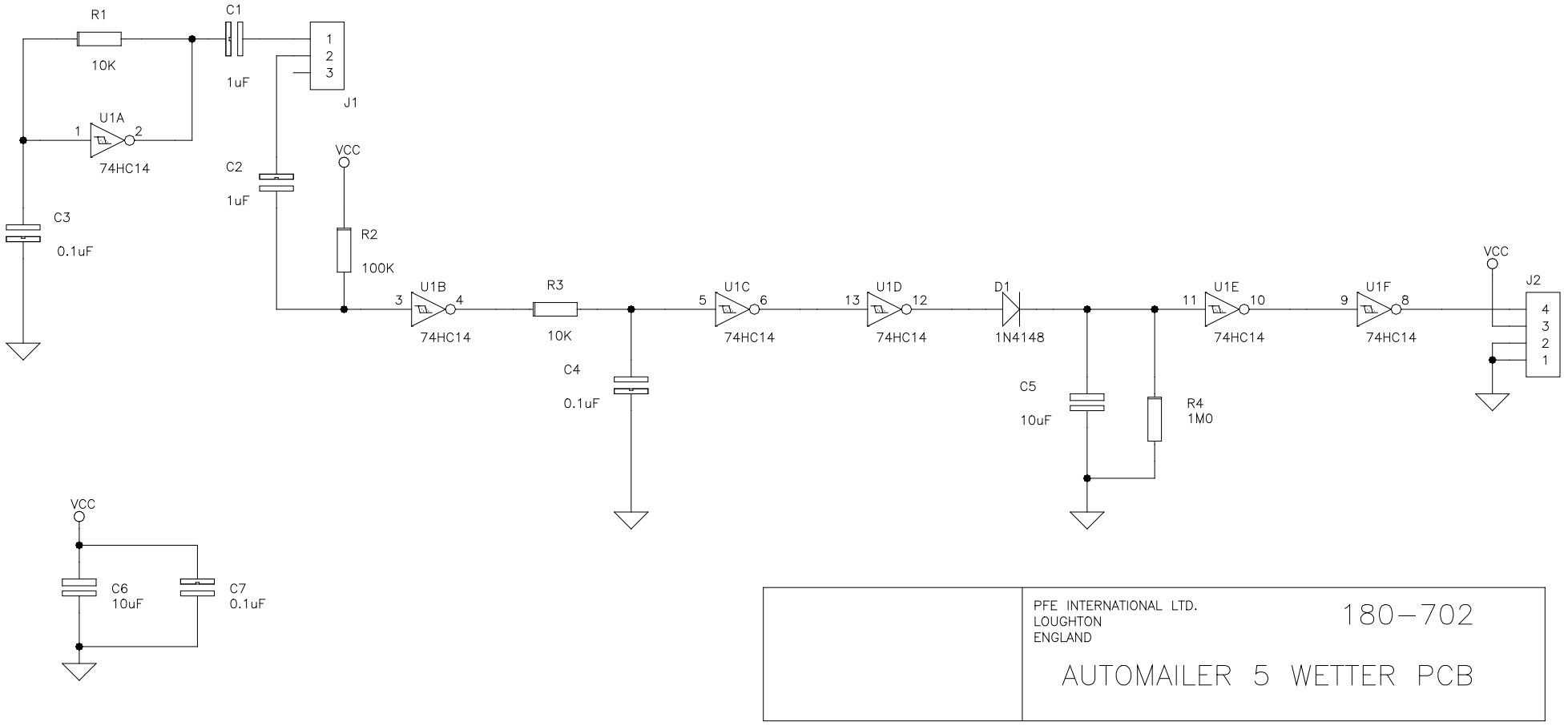
5.18 Stepper PCB 180-675 Circuit Diagram



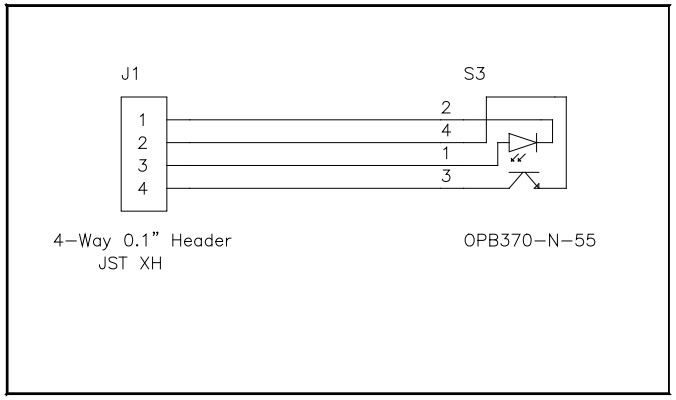
5.19 Ribbon Splitter PCB 180-691 Circuit Diagram (Standard)

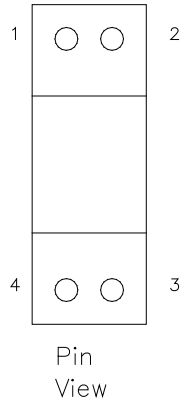


5.20 Ribbon Splitter PCB 180-704 Circuit Diagram (Hi-Cap Feeder)



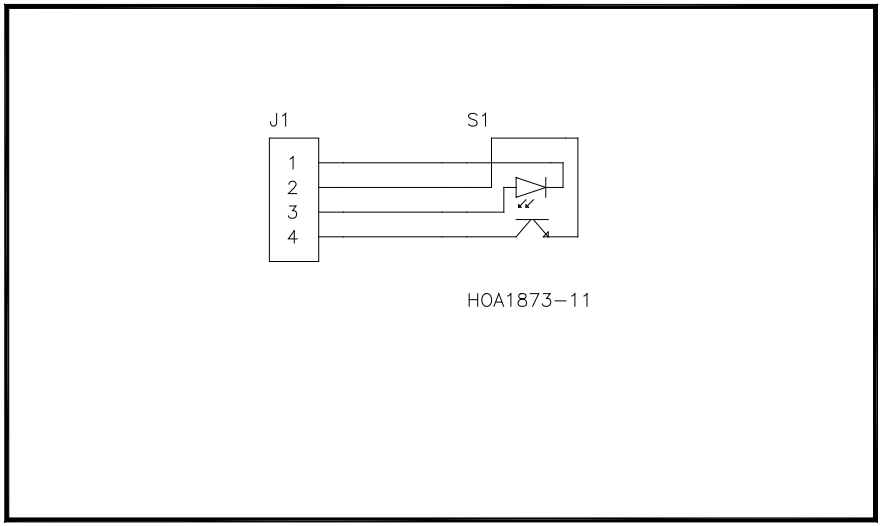
5.21 - Wetter PCB 180-702 Circuit Diagram





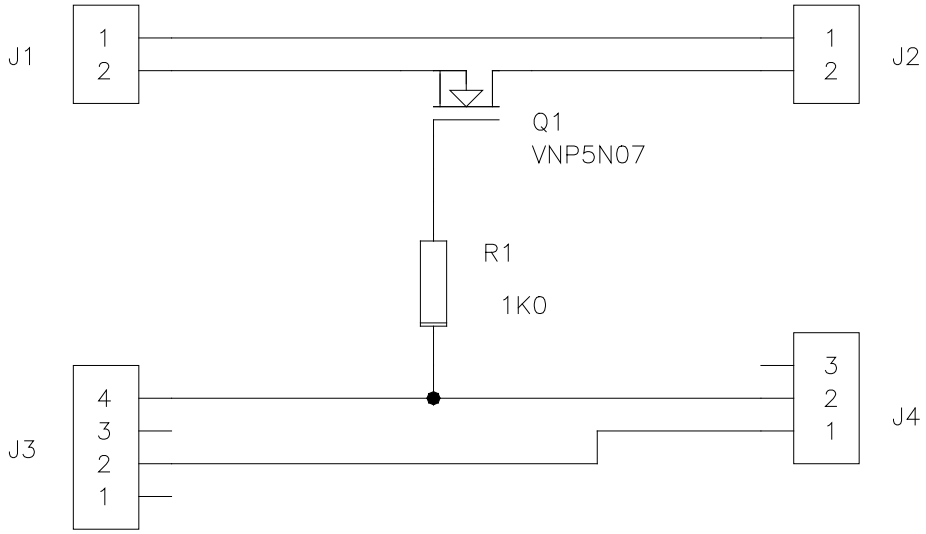
	PFE INTERNATIONAL LTD. LOUGHTON ENGLAND 180–689 AUTOMAILER 5 DISC SENSOR PCB

5.22 - Disc Sensor PCB 180-689 Circuit Diagram



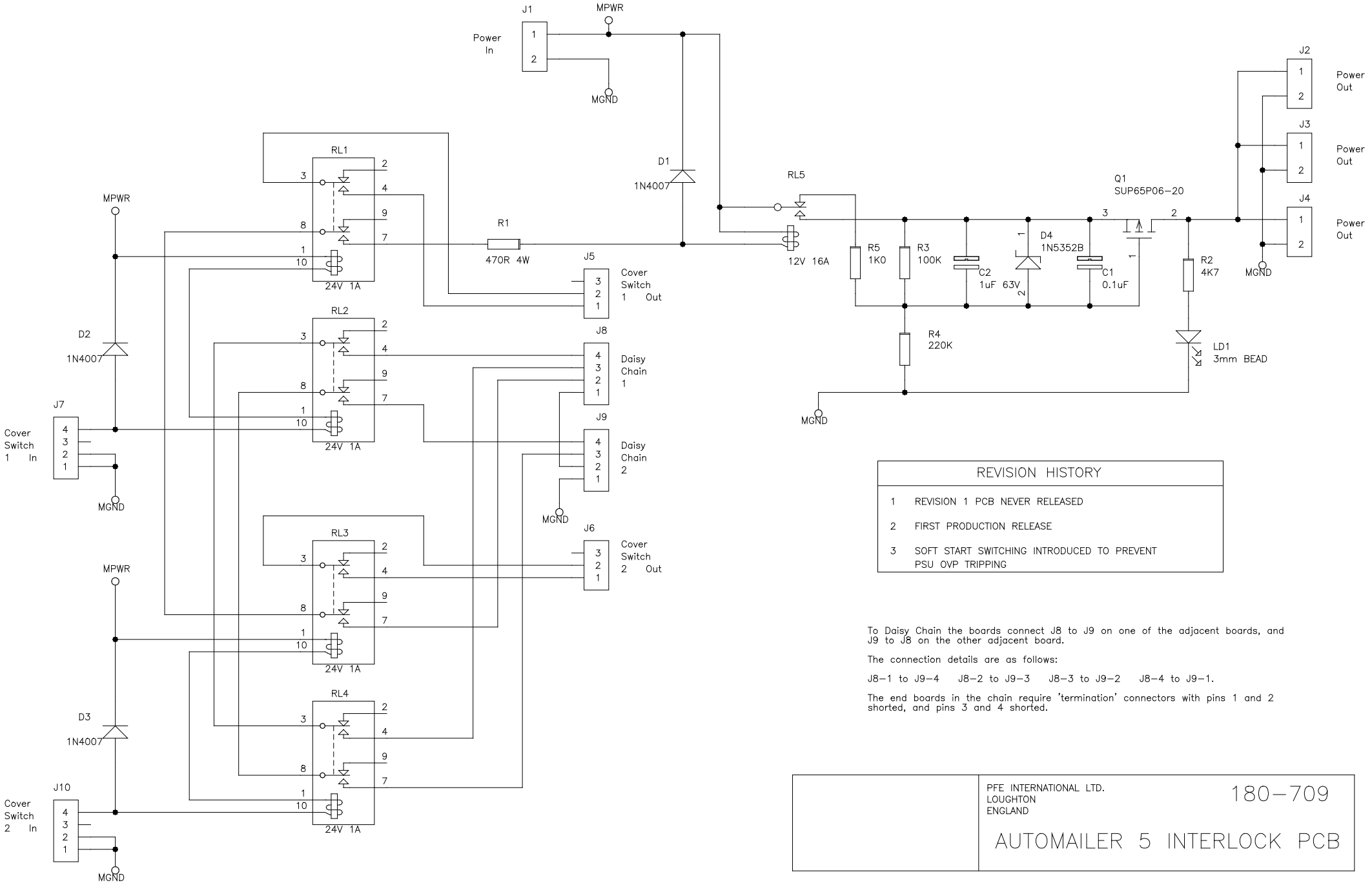
	PFE INTERNATIONAL LTD. LOUGHTON ENGLAND 180-692 AUTOMAILER 5 VANE SENSOR PCB

5.23 - Vane Sensor PCB 180-692 Circuit Diagram



	PFE INTERNATIONAL LTD. LOUGHTON ENGLAND 180–714 AUTOMAILER 5 OVERFLOW PCB

5.24 - Overflow PCB 180-714 Circuit Diagram



REVISION HISTORY	
1	REVISION 1 PCB NEVER RELEASED
2	FIRST PRODUCTION RELEASE
3	SOFT START SWITCHING INTRODUCED TO PREVENT PSU OVP TRIPPING

To Daisy Chain the boards connect J8 to J9 on one of the adjacent boards, and J9 to J8 on the other adjacent board.

The connection details are as follows:

J8–1 to J9–4 J8–2 to J9–3 J8–3 to J9–2 J8–4 to J9–1.

The end boards in the chain require 'termination' connectors with pins 1 and 2 shorted, and pins 3 and 4 shorted.

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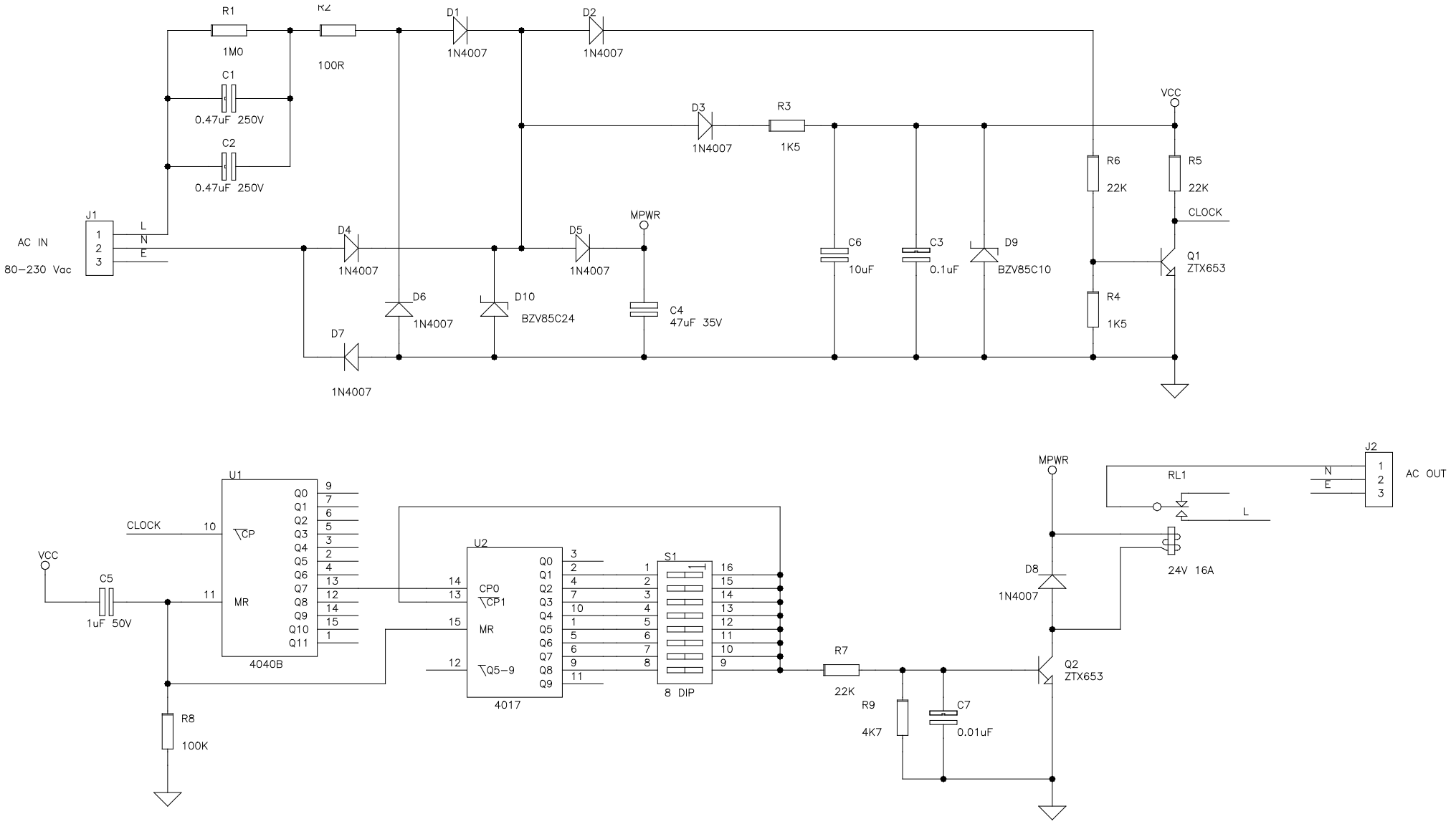
ENGLAND

180–709

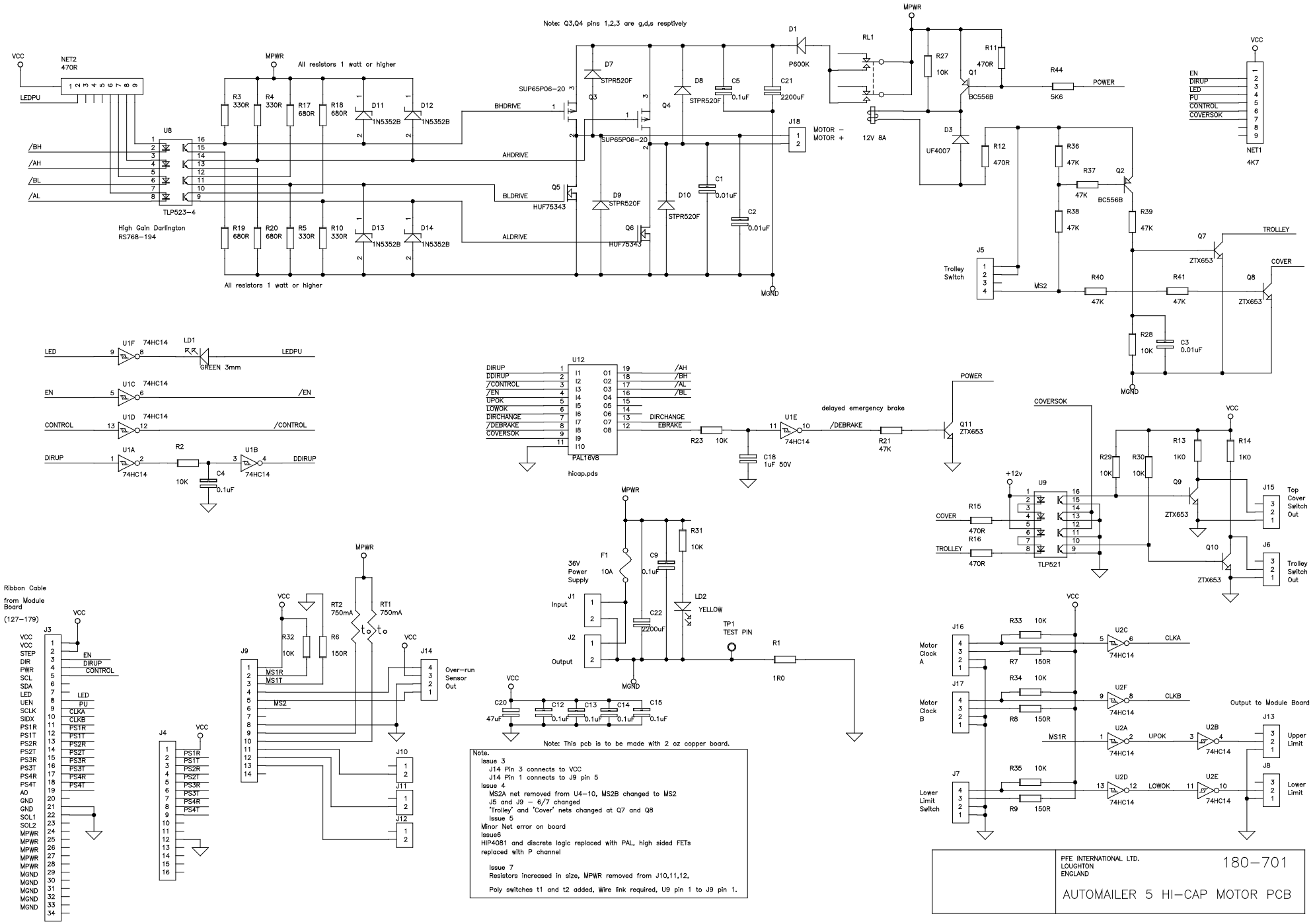
AUTOMAILER 5 INTERLOCK PCB

5.25 - Interlock PCB 180-709 Circuit Diagram

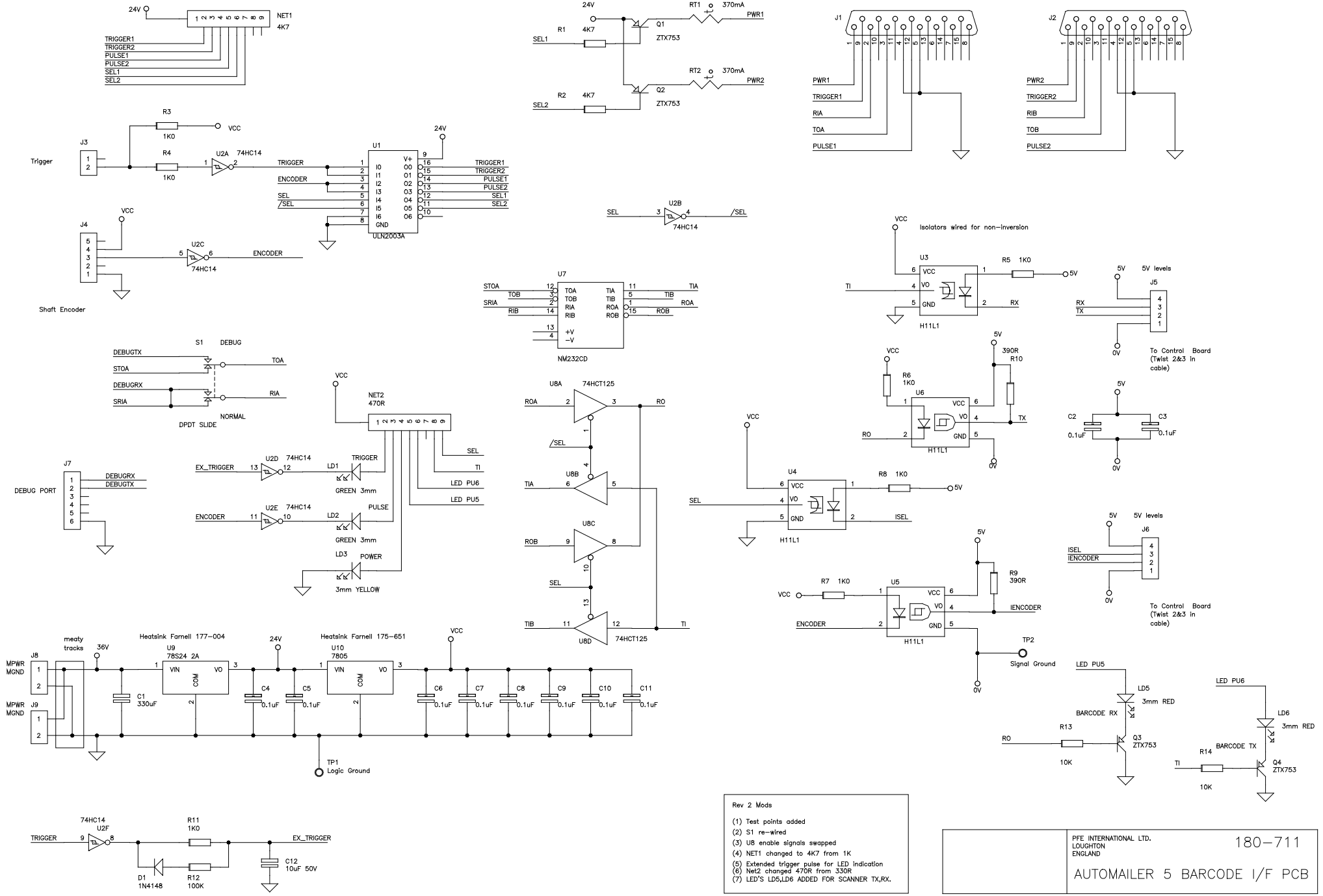


	PFE INTERNATIONAL LTD. LOUGHTON ENGLAND 180–710 AUTOMAILER 5 MAINS DELAY PCB

5.26 - Mains Delay PCB 180-710 Circuit Diagram



5.27 - Hi-Cap Motor PCB 180-701 Circuit Diagram



Rev 2 Mods

(1) Test points added
(2) S1 re-wired
(3) U8 enable signals swapped
(4) NET1 changed to 4K7 from 1K
(5) Extended trigger pulse for LED indication
(6) Net2 changed 470R from 330R
(7) LED'S LD5,LD6 ADDED FOR SCANNER TX,RX.

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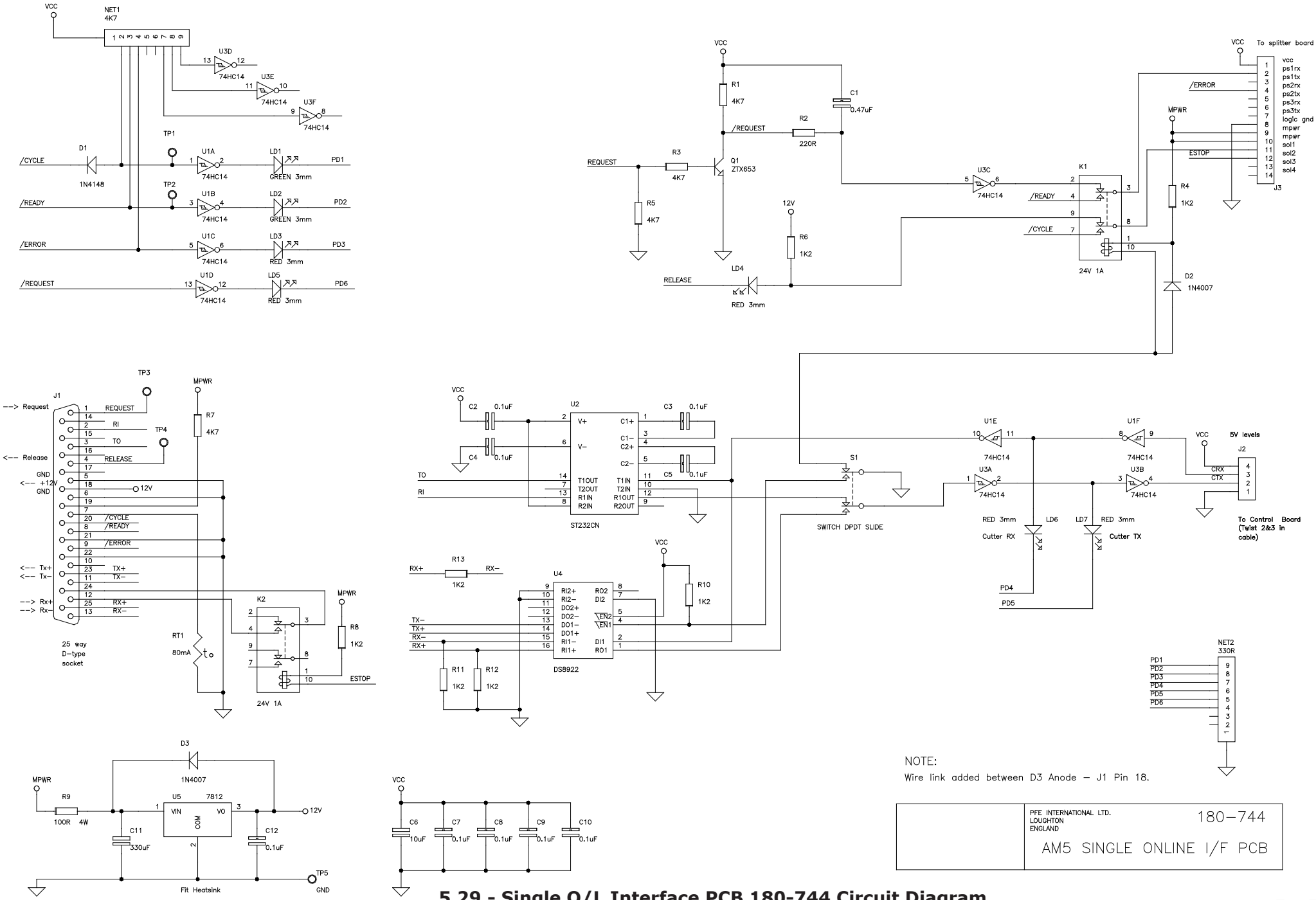
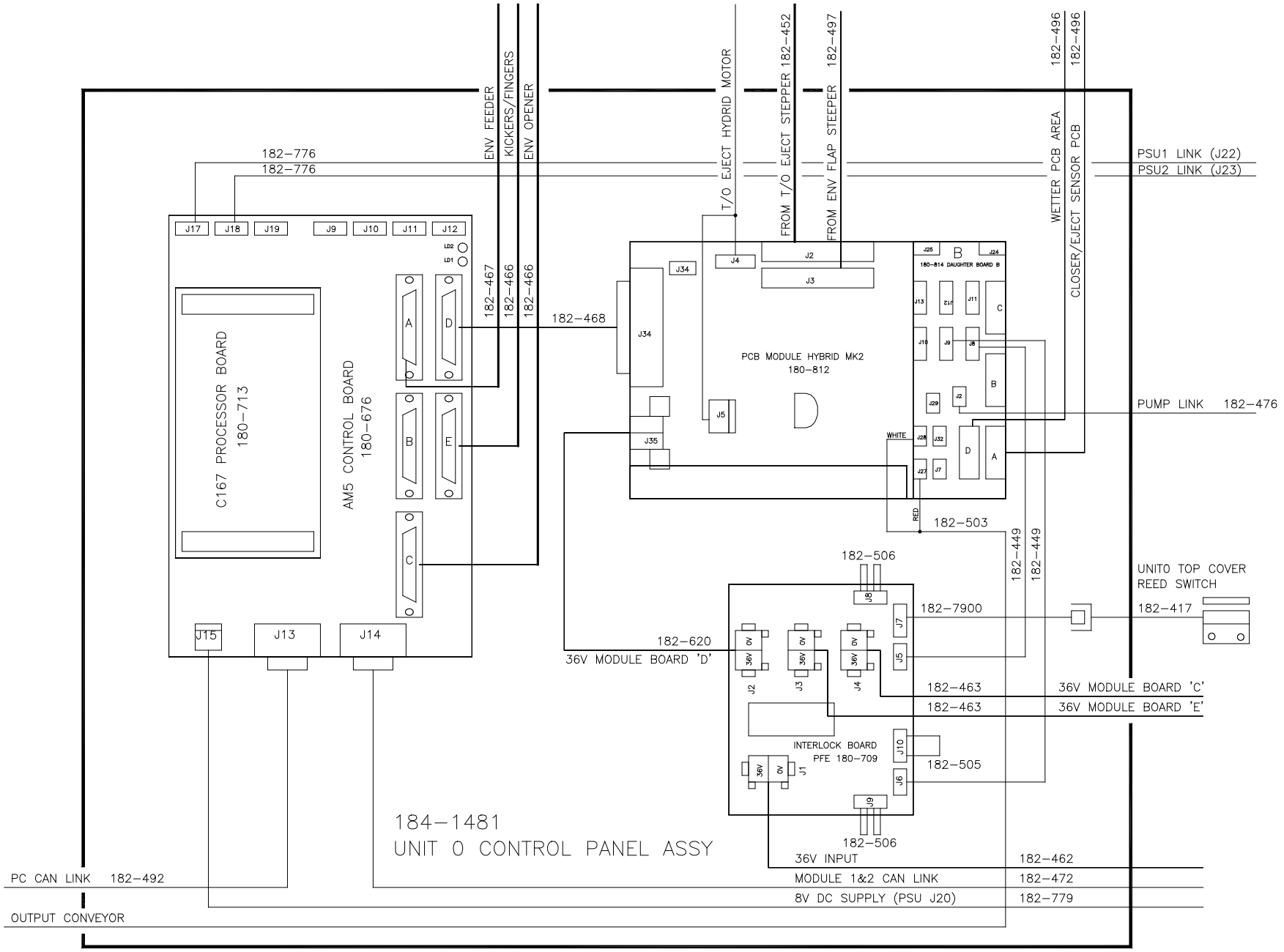
180-711

AUTOMAILER 5 BARCODE I/F PCB

5.28 - Barcode Interface PCB 180-711 Circuit Diagram

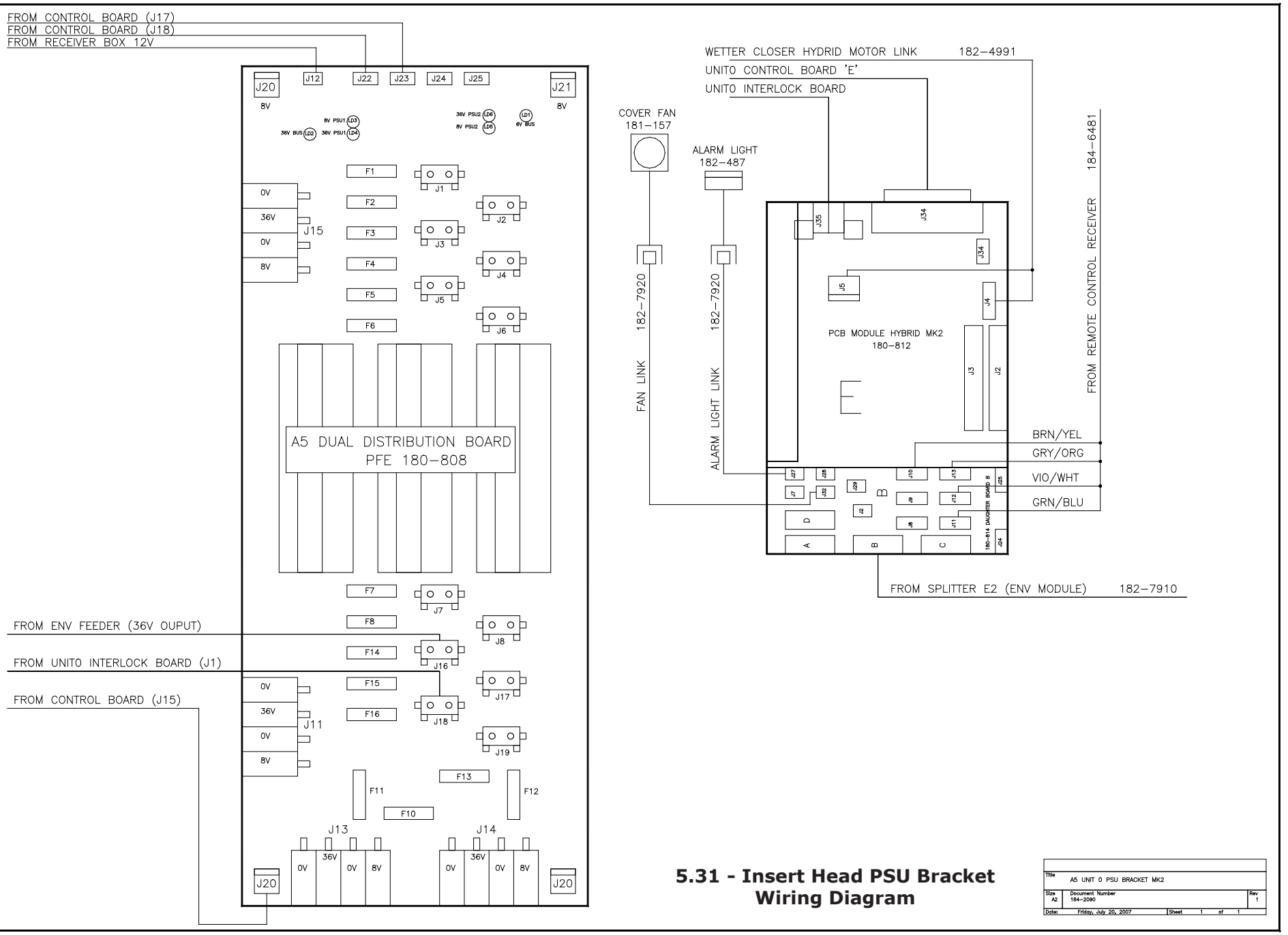


5.29 - Single O/L Interface PCB 180-744 Circuit Diagram



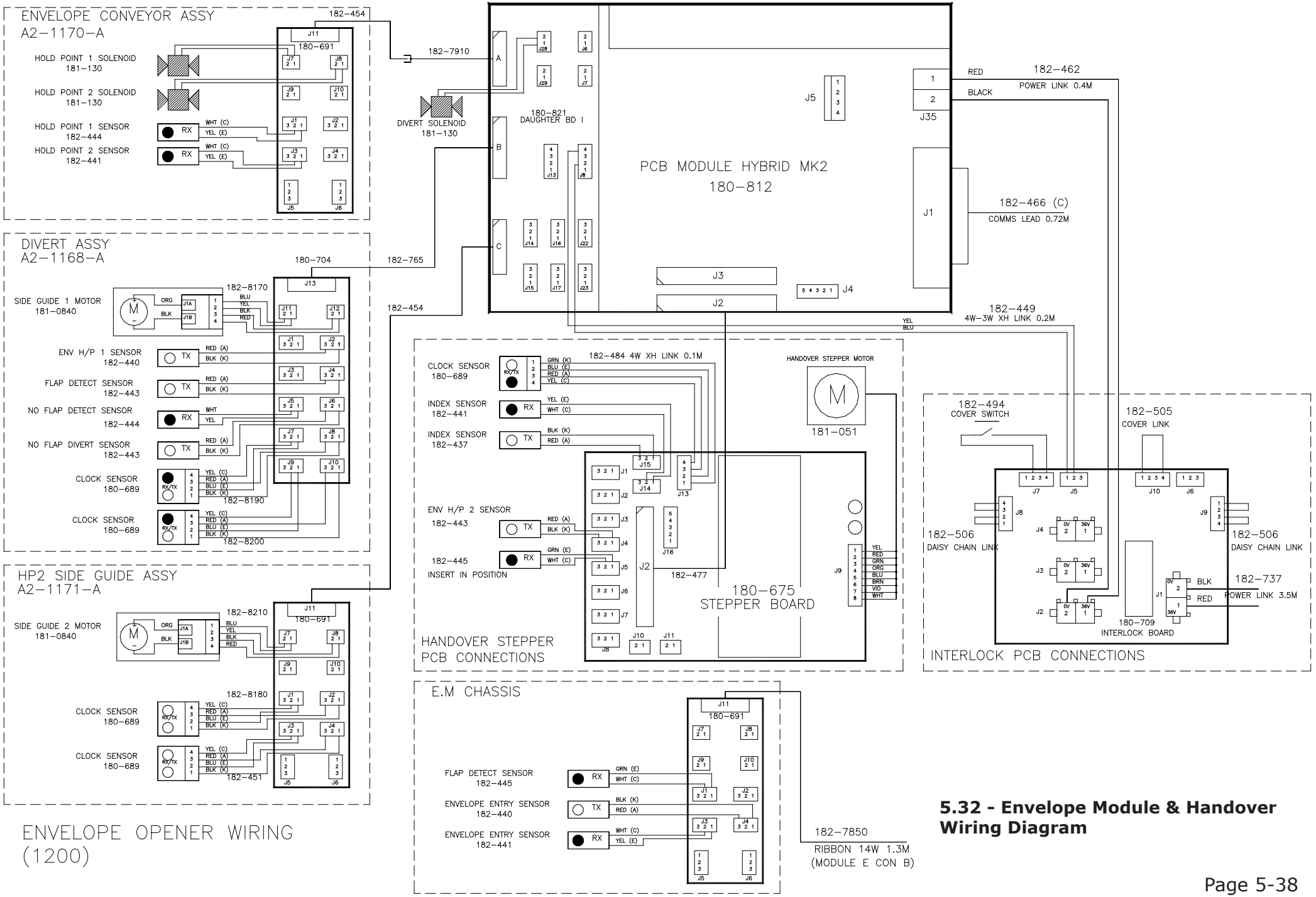
5.30 - Insert Head Electrical Panel Wiring Diagram

Title: HEAD CONTROL PANEL ASSY		
Size: A2	Document Number: 184-1481	Rev: 1
Date: Friday, July 20, 2007	Sheet 1 of 1	

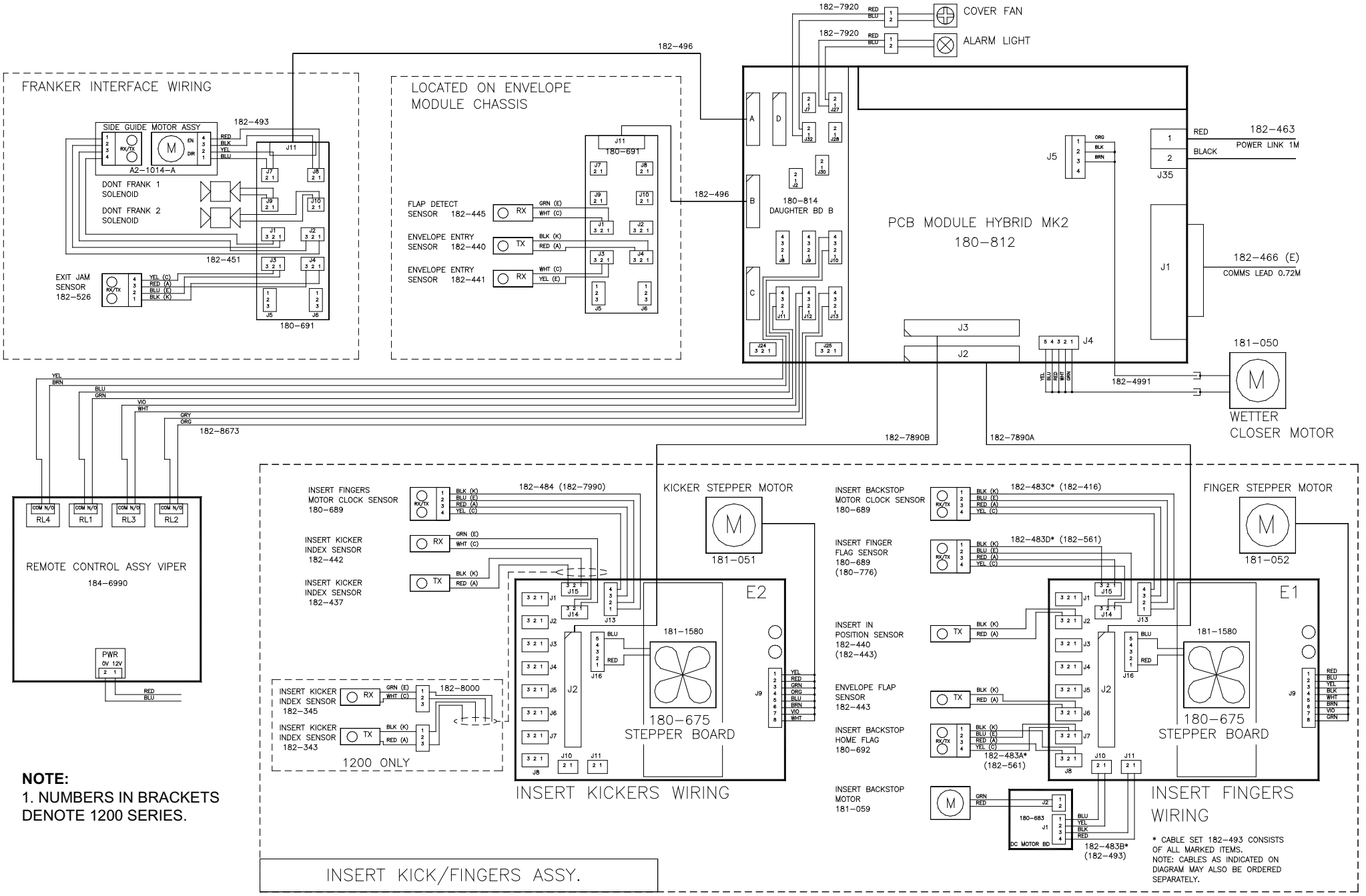


5.31 - Insert Head PSU Bracket Wiring Diagram

Title: A5 UNIT 0 PSU BRACKET MK2		
Size: A2	Document Number: 184-2080	Rev: 1
Date: Friday, July 20, 2007	Sheet 1 of 1	

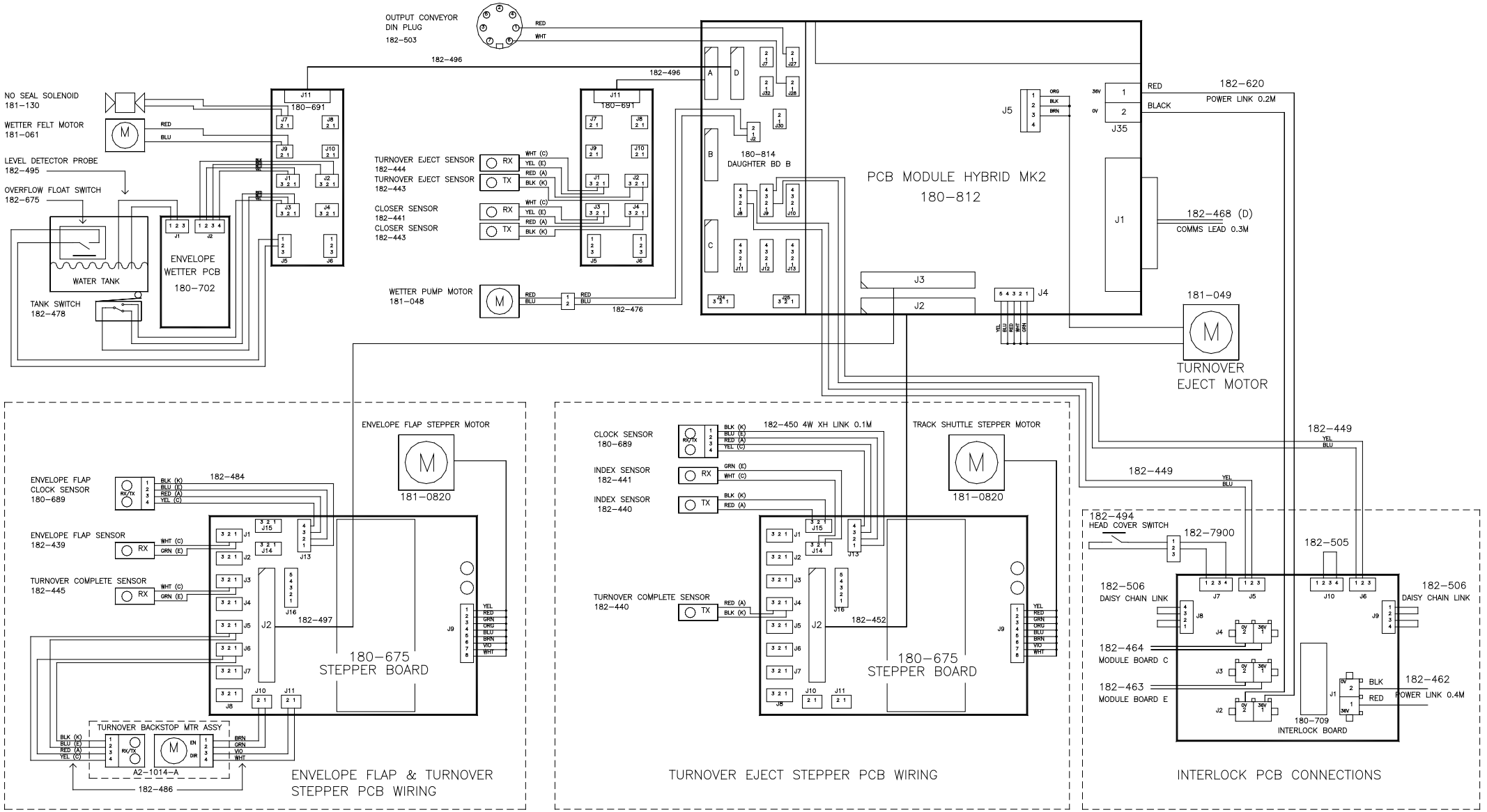


5.32 - Envelope Module & Handover Wiring Diagram



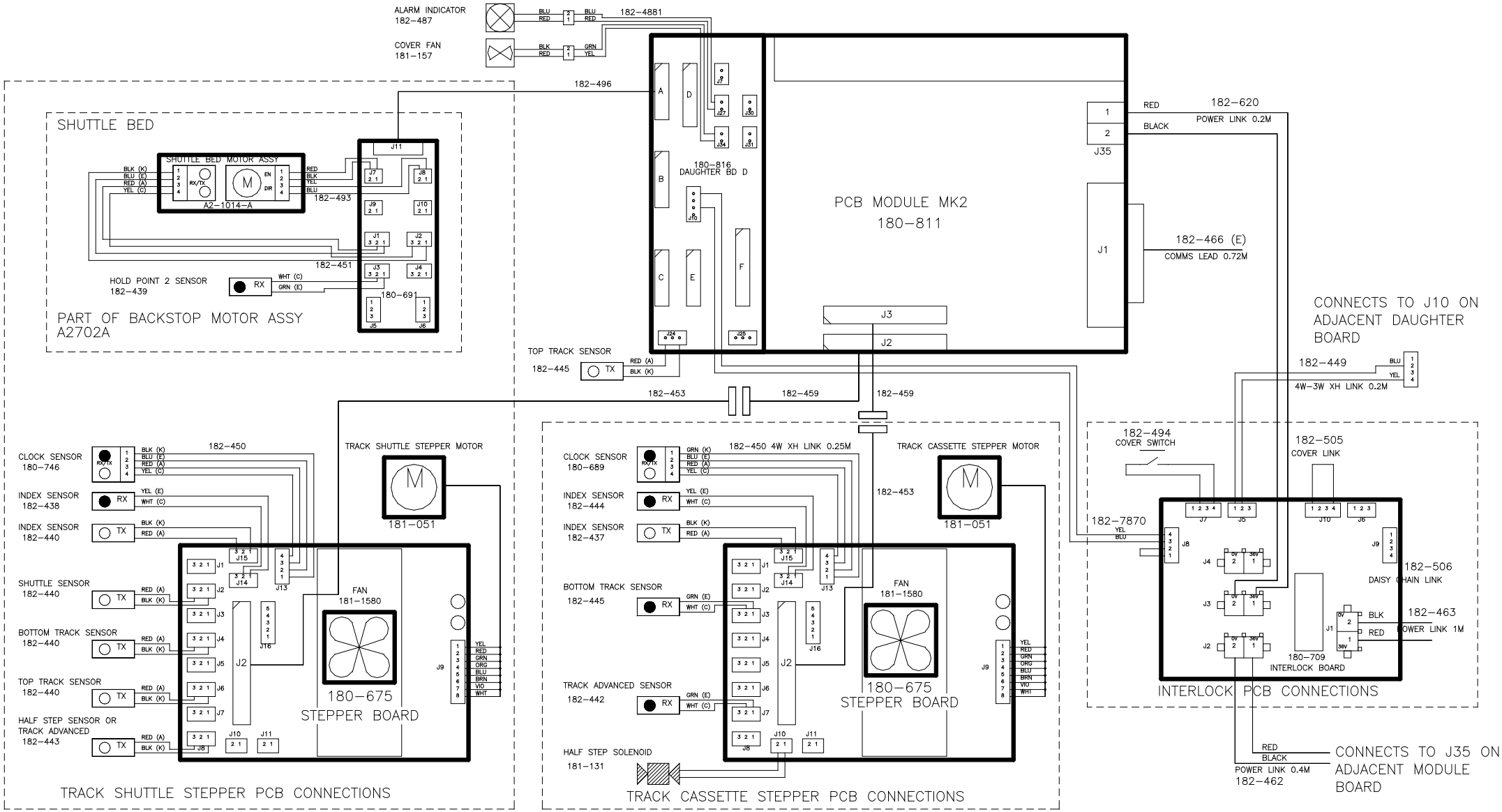
NOTE:
1. NUMBERS IN BRACKETS DENOTE 1200 SERIES.

INSERT HEAD – MODULE E WIRING (KICKER, FRANKER I/F, REMOTE)



INSERT HEAD – MODULE D WIRING (TURNOVER & WETTER/CLOSER)

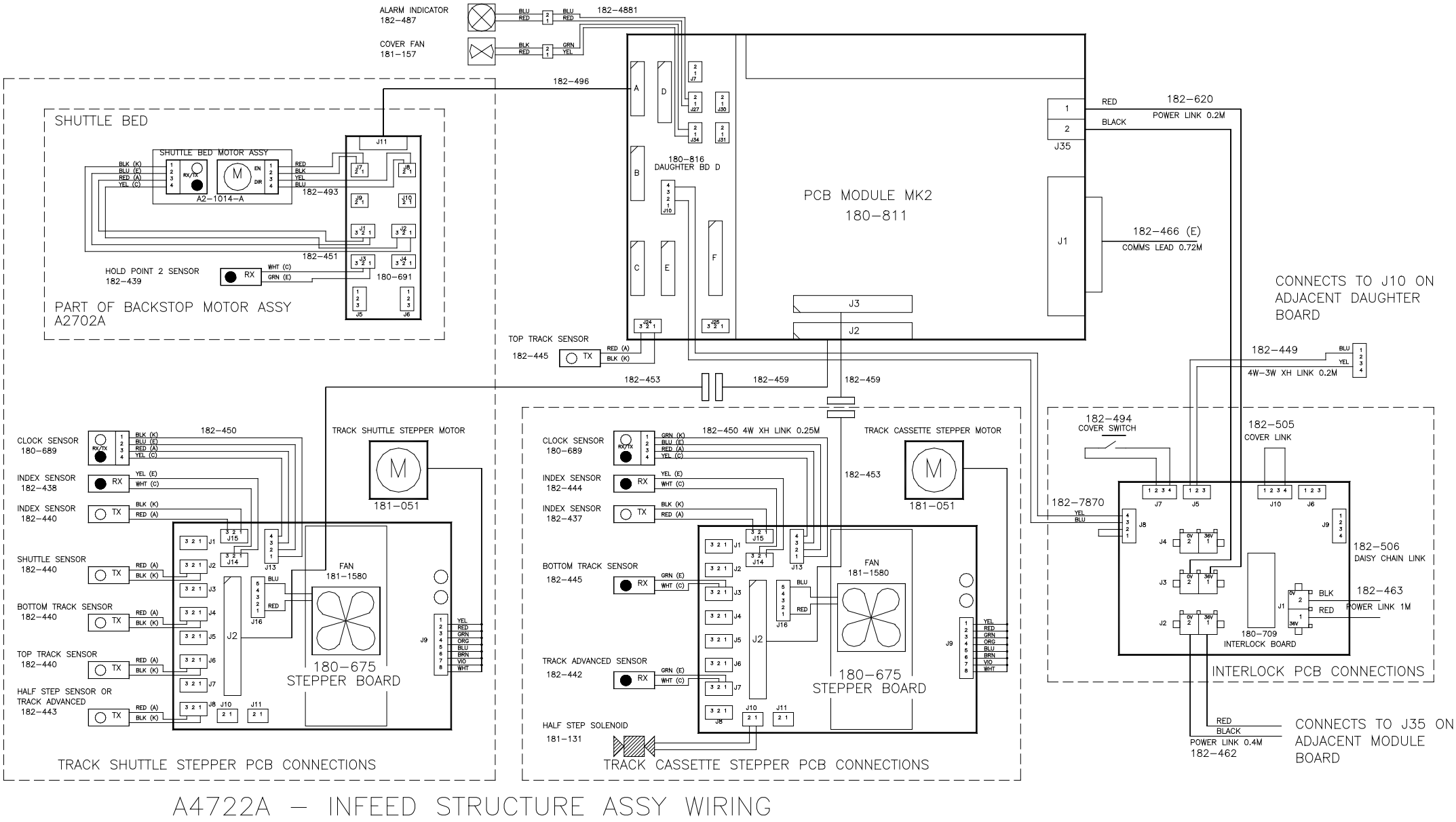
5.34 - Turnover & Wetter/Closer Wiring Diagram



RELATED ELECTRICAL KITS
907–101 – INSERT TRACK CASSETTE
907–0951 – MODULE PAIR BASE KIT
907–0981 – INSERT TRACK MODULE

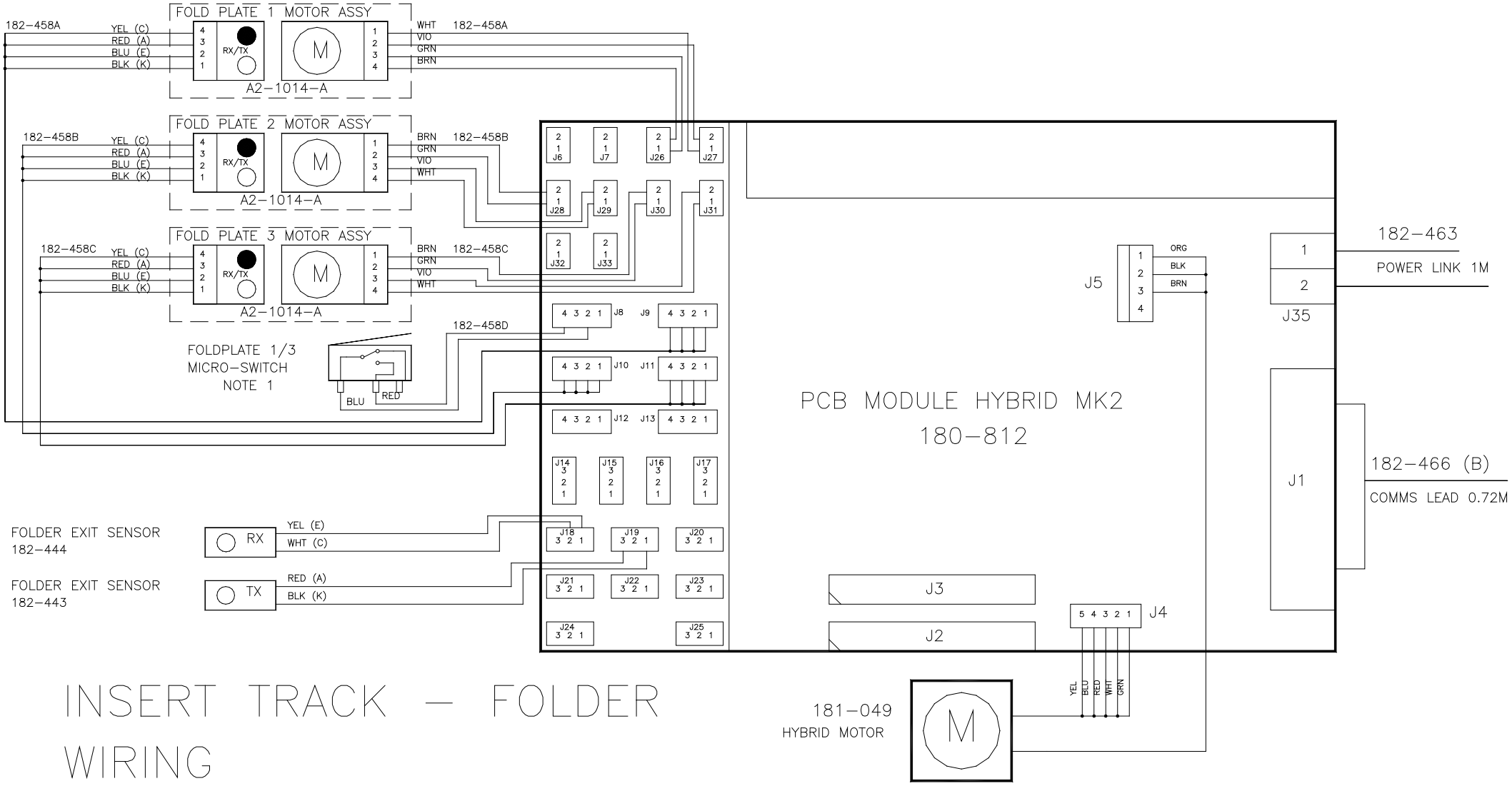
A4722A – INFEED STRUCTURE ASSY WIRING

5.35 - Track Pair Electrical Panel Wiring Diagram



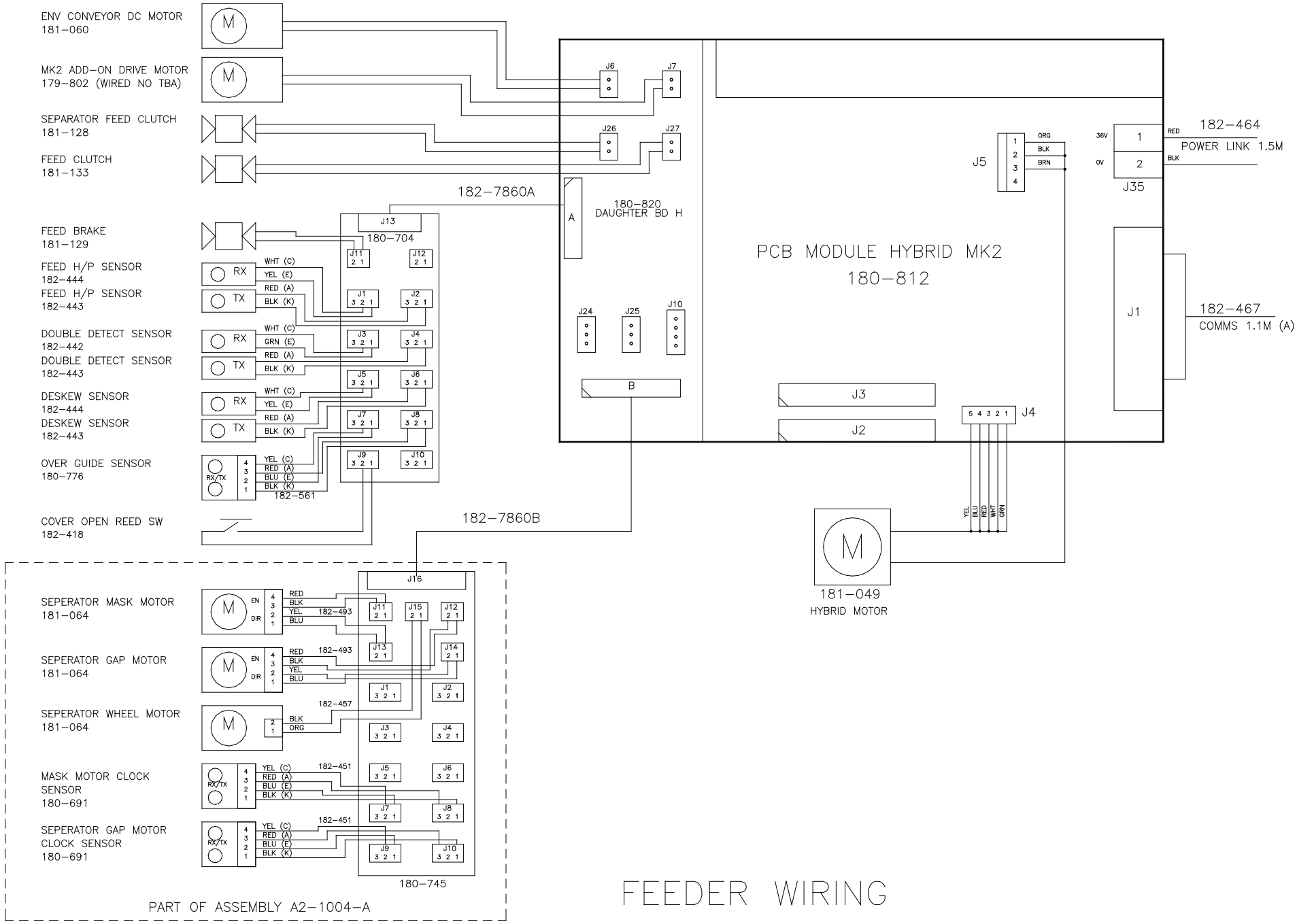
A4722A – INFEED STRUCTURE ASSY WIRING

5.36 - Insert Track Shuttle & Cassette Wiring Diagram

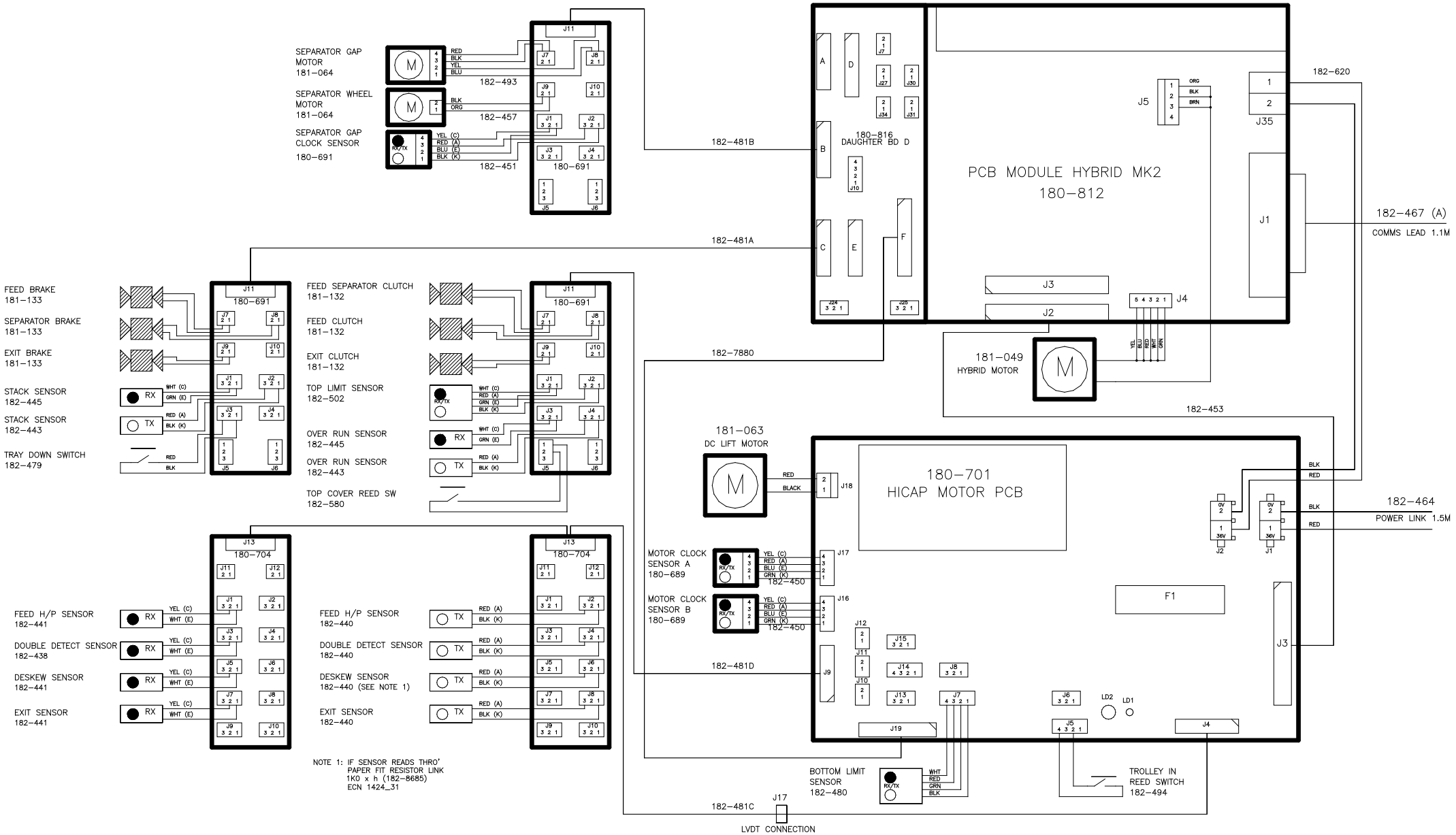


INSERT TRACK – FOLDER WIRING

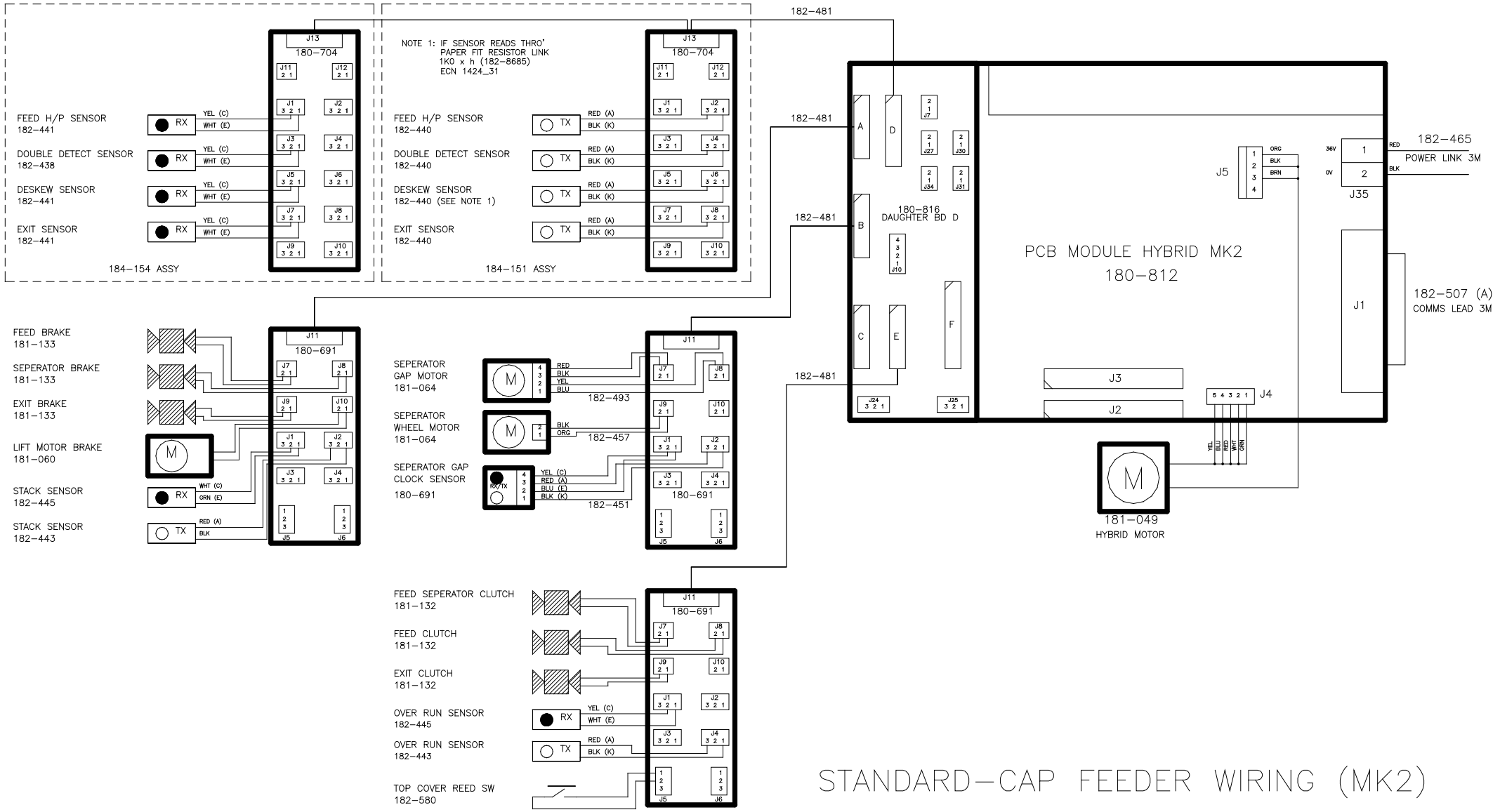
5.37 - Folder Wiring Diagram



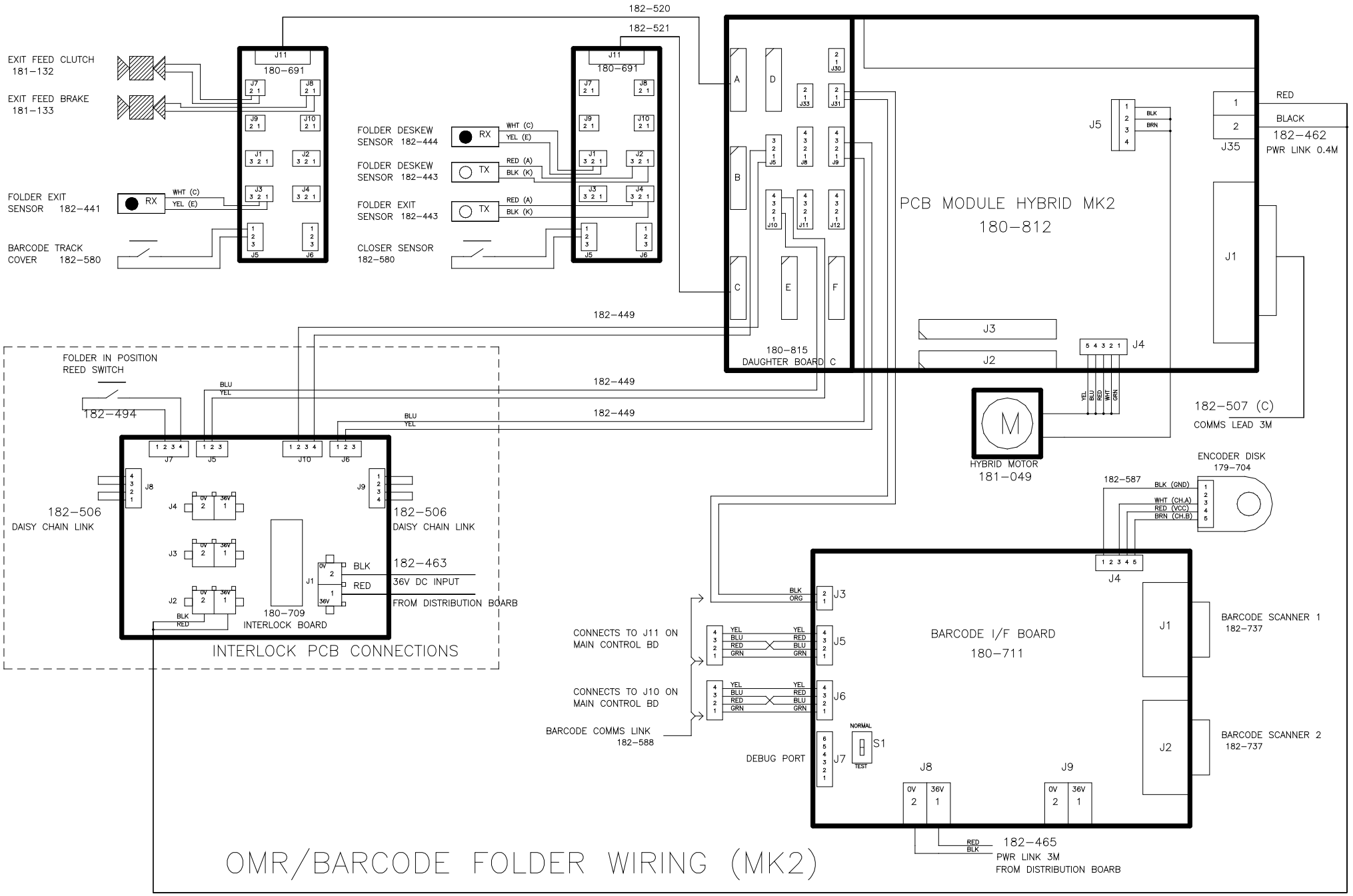
5.38 - Feeder Wiring Diagram



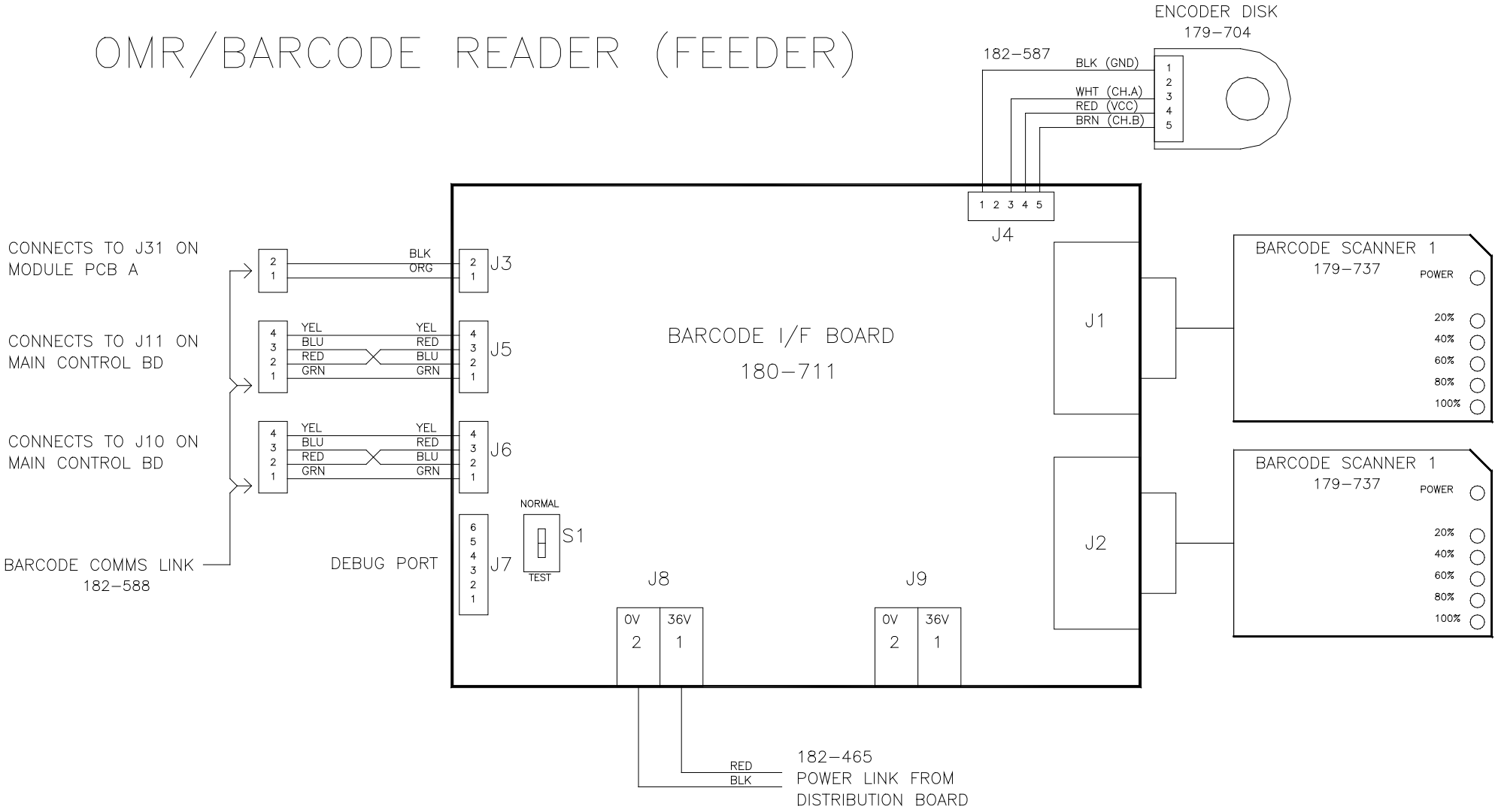
5.39 - Hi-Cap Feeder Wiring Diagram



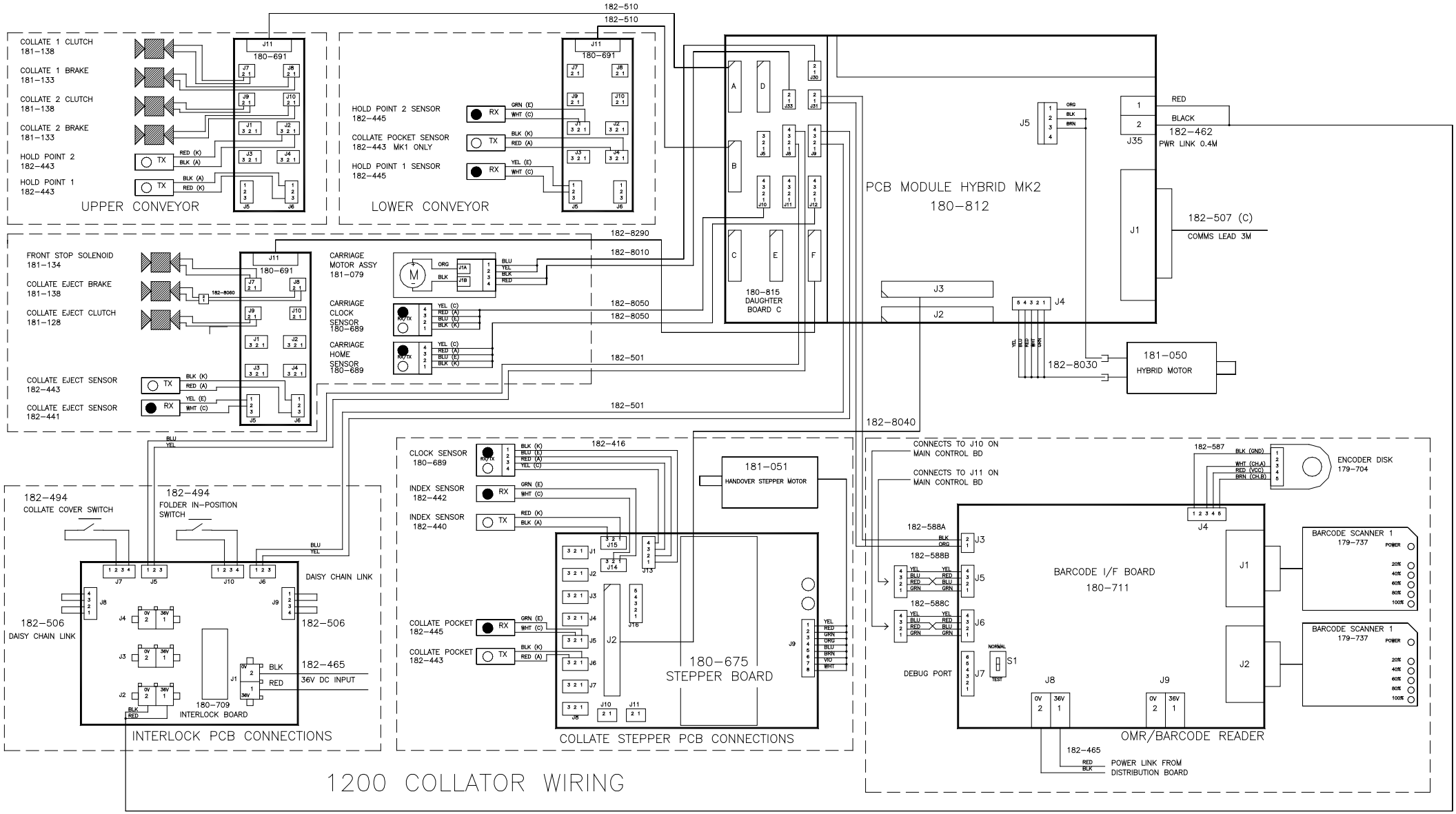
5.40 - Standard-Cap Feeder Wiring Diagram



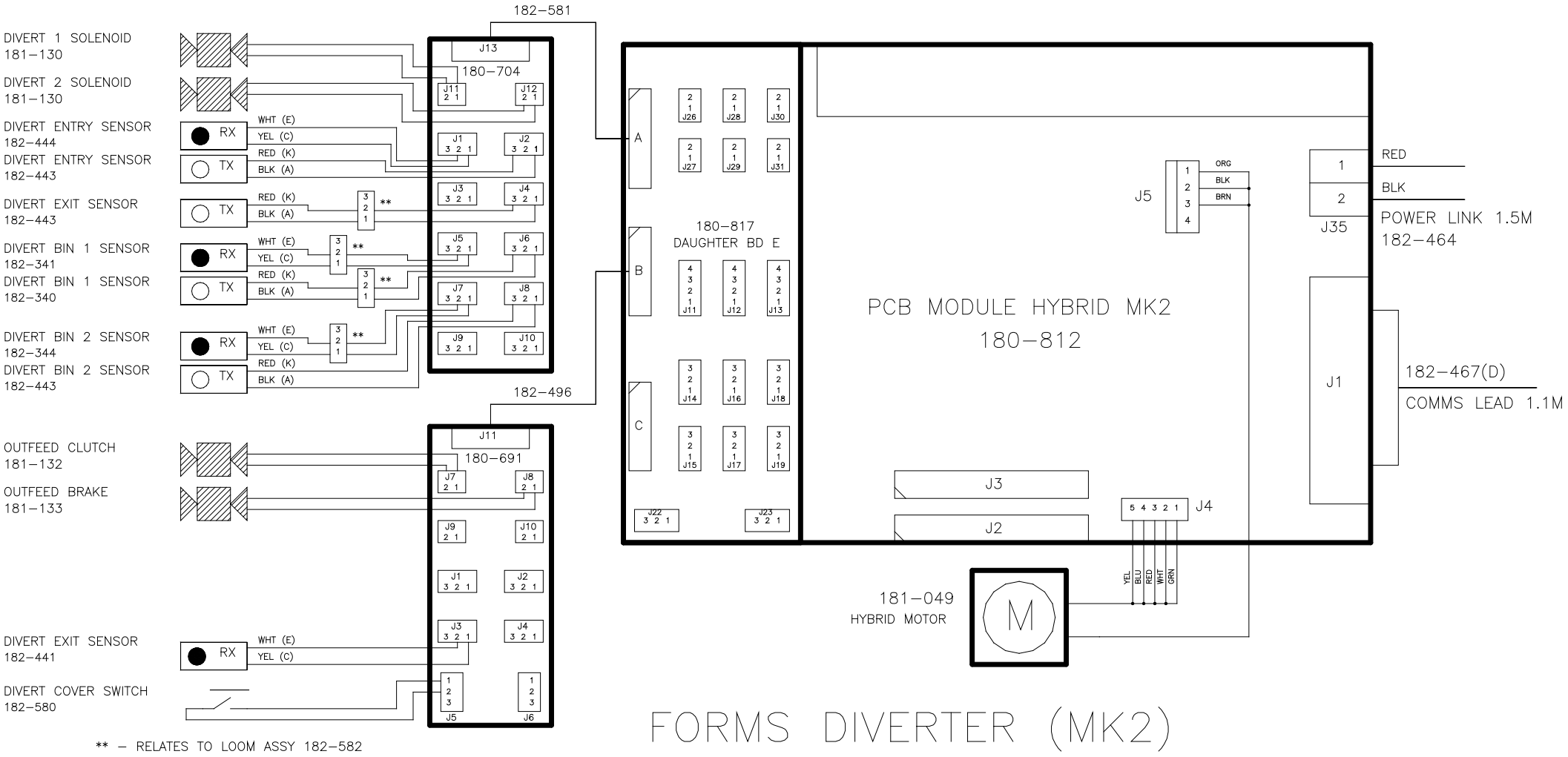
5.41 - OMR/Barcode Reader (Folder) Wiring Diagram



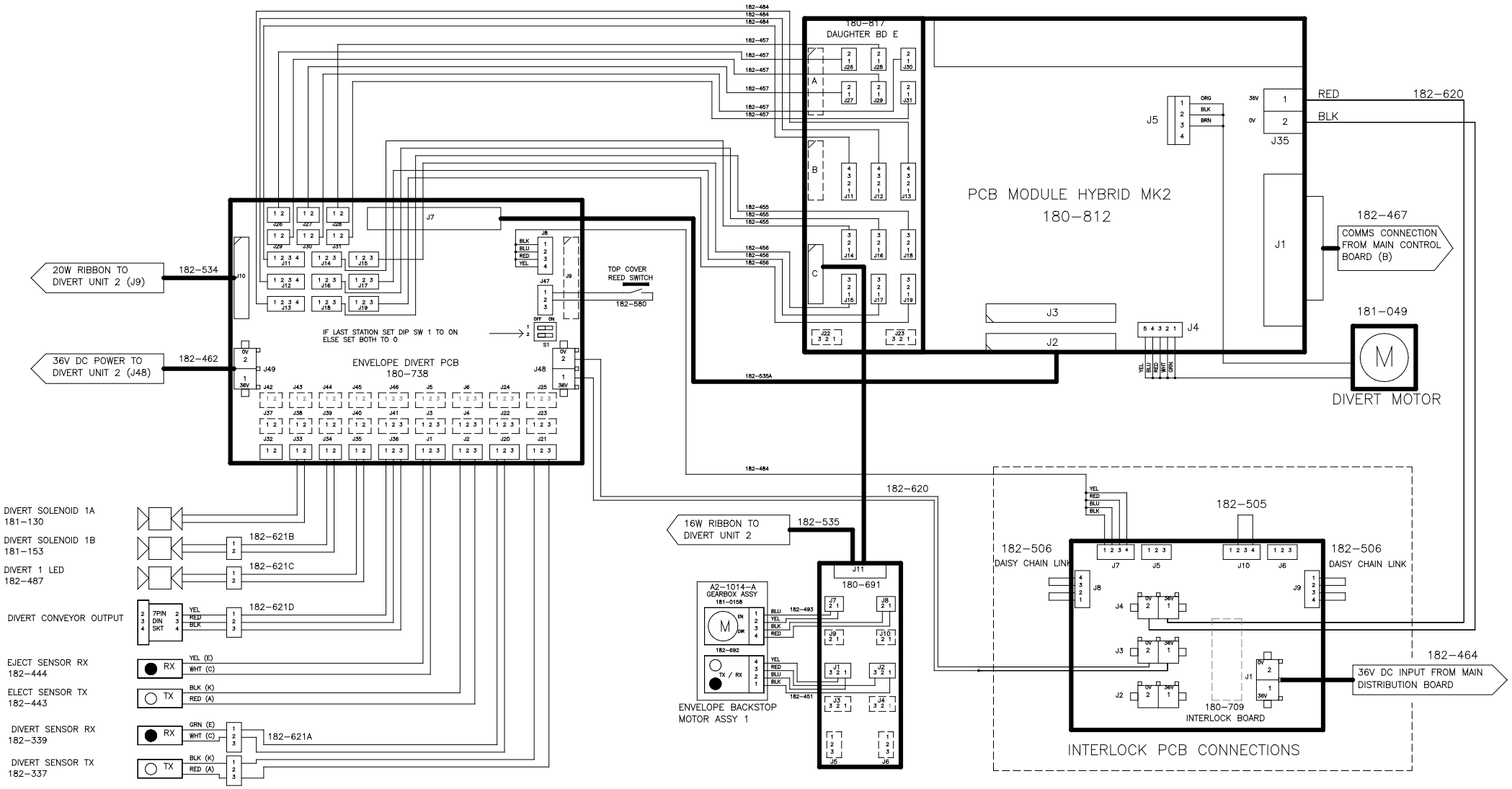
5.42 - OMR/Barcode Reader (Feeder) Wiring Diagram



5.43 - Collator Wiring Diagram

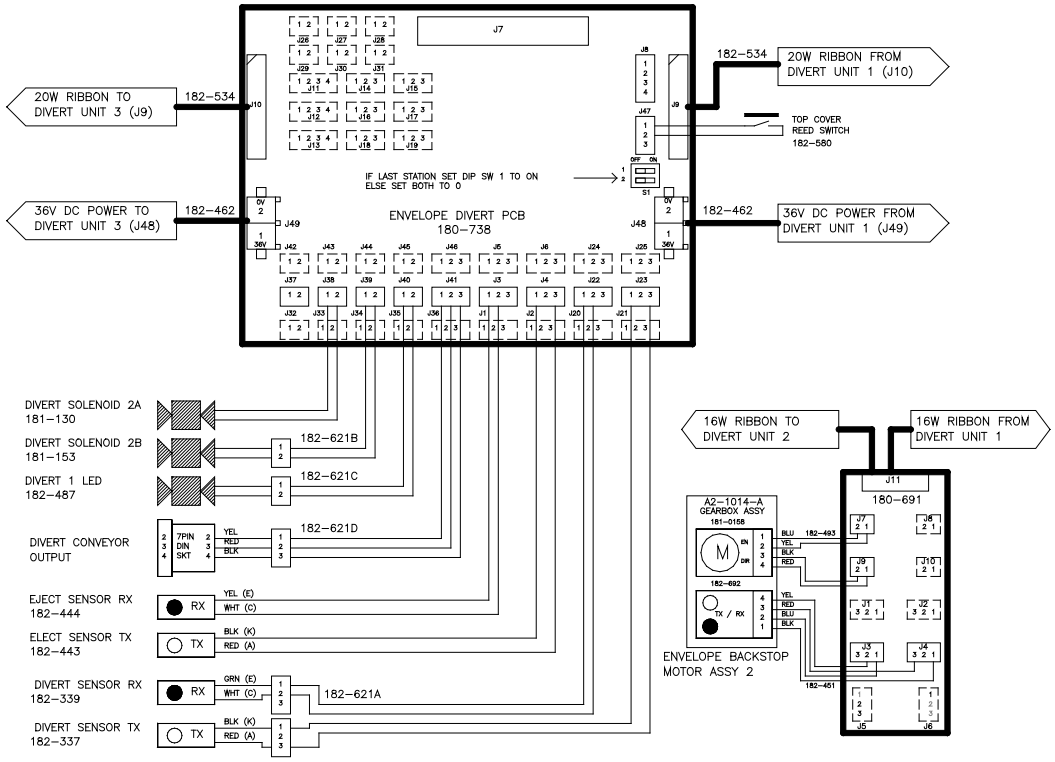


5.44 - Forms Diverter Wiring Diagram

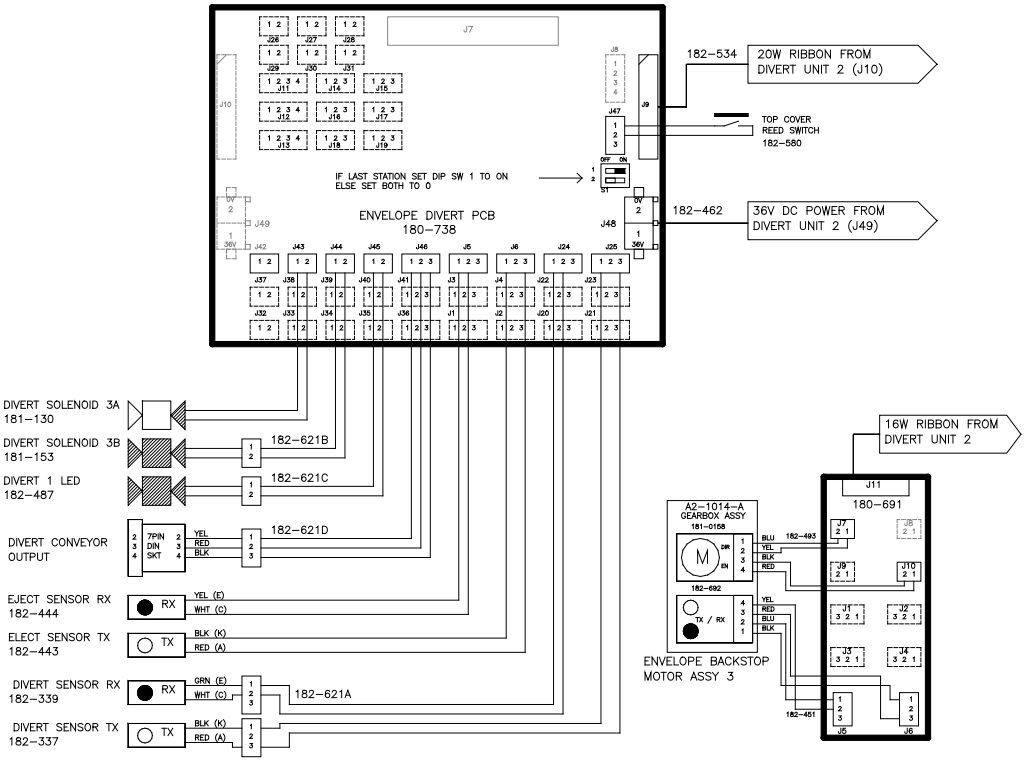


OUTPUT DIVERT UNIT 1

5.45 - First Envelope Diverter (Output) Wiring Diagram

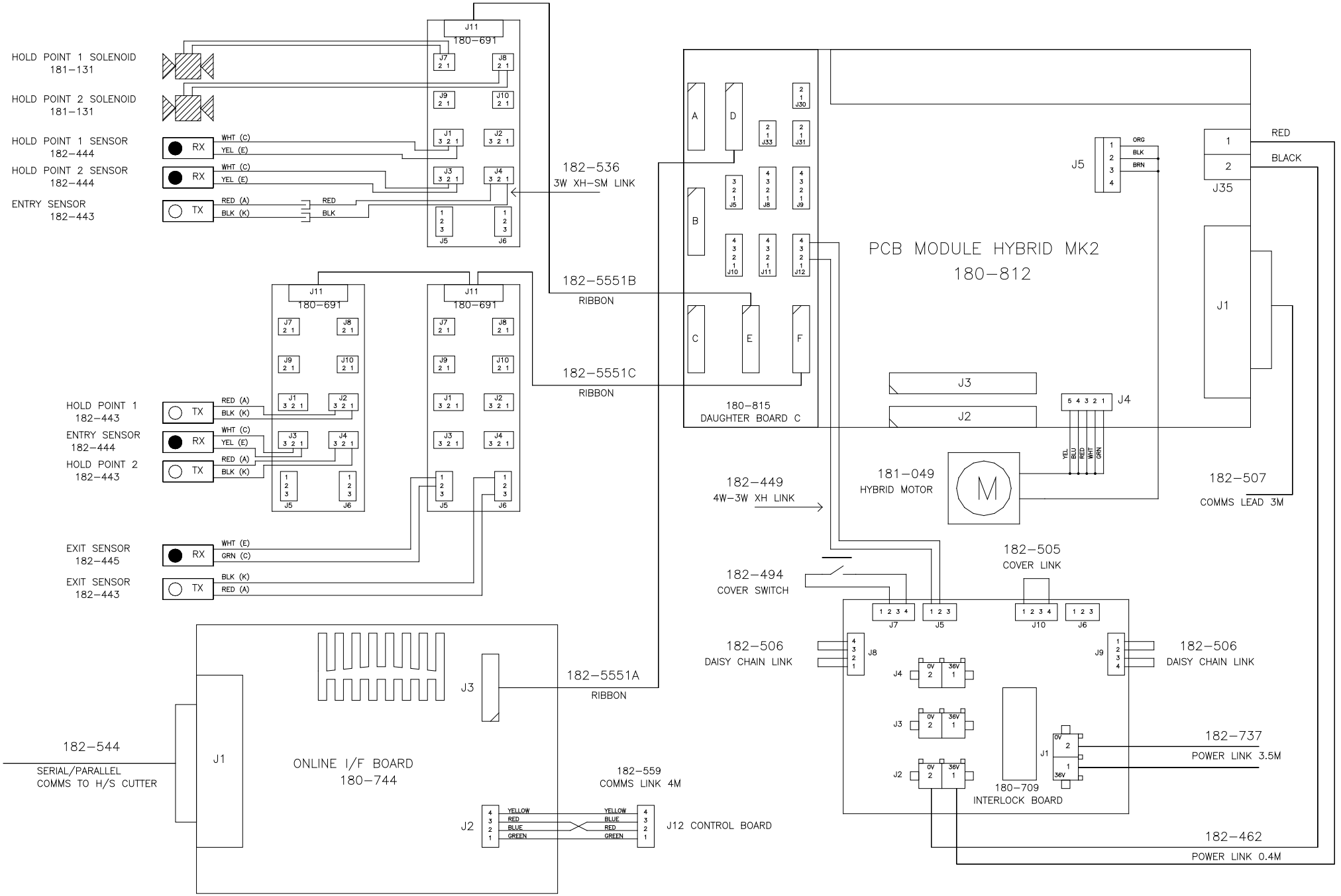


OUTPUT DIVERT UNIT 2

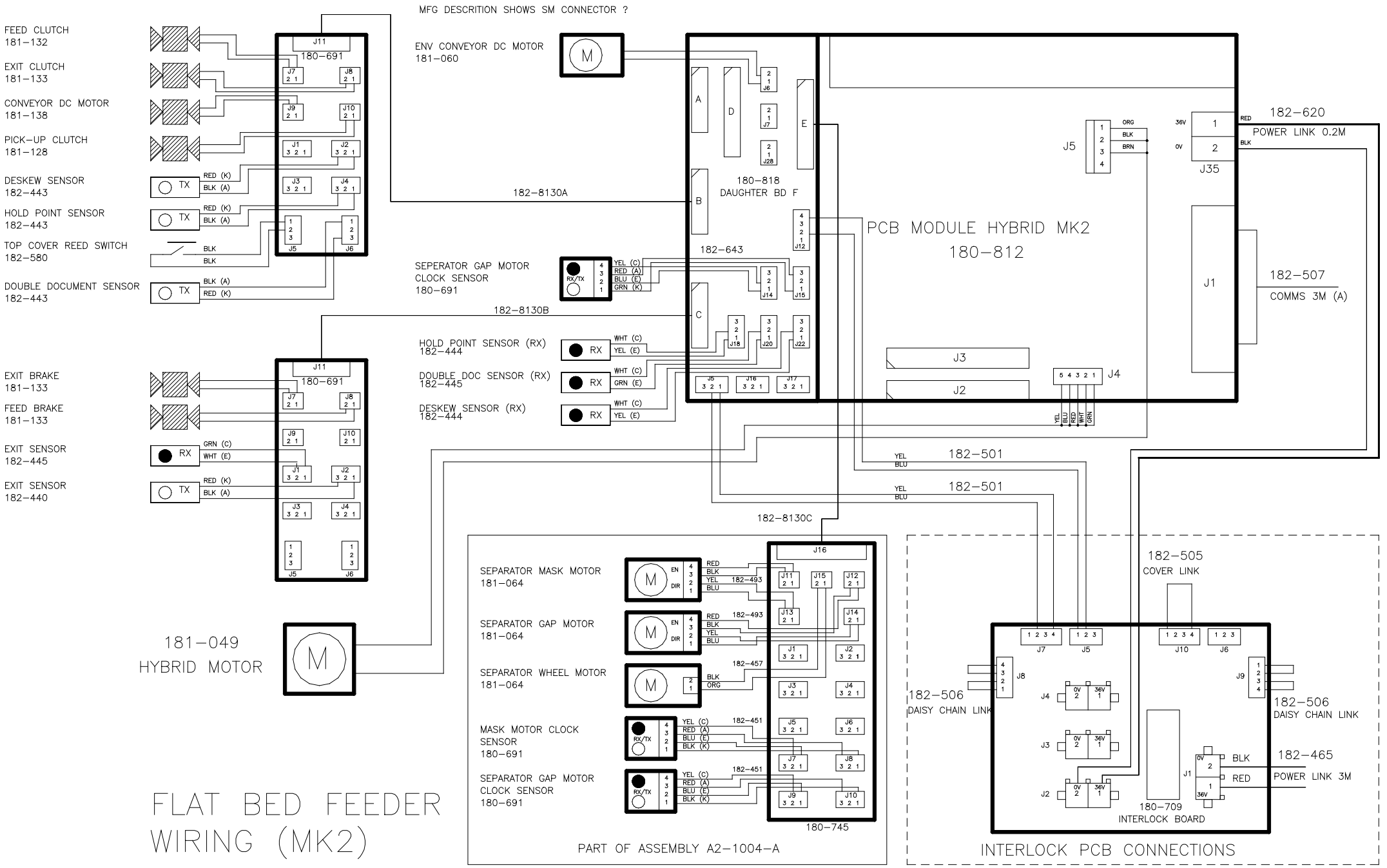


OUTPUT DIVERT UNIT 3

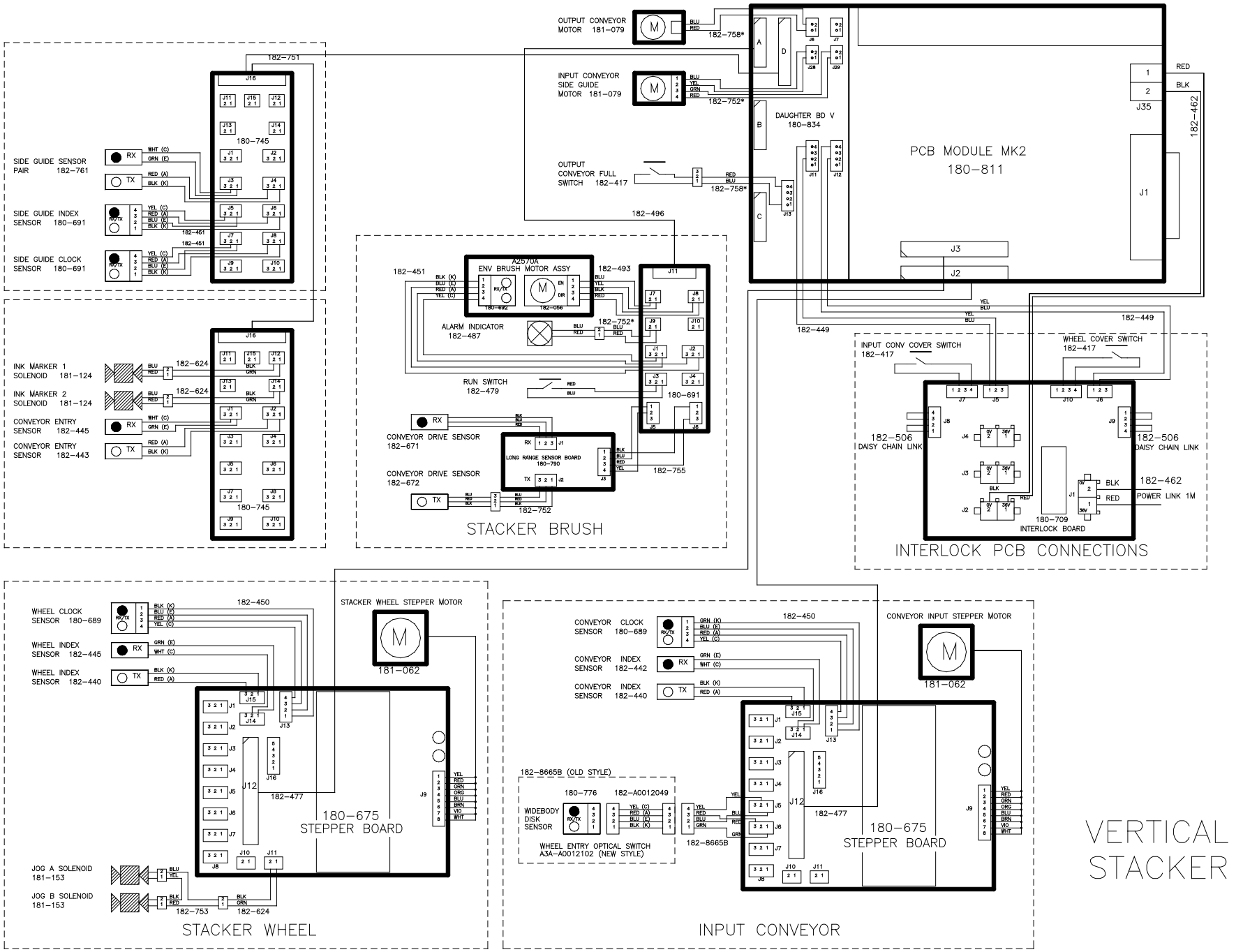
5.46 - Add-on Envelope Diverters (Output) Wiring Diagram



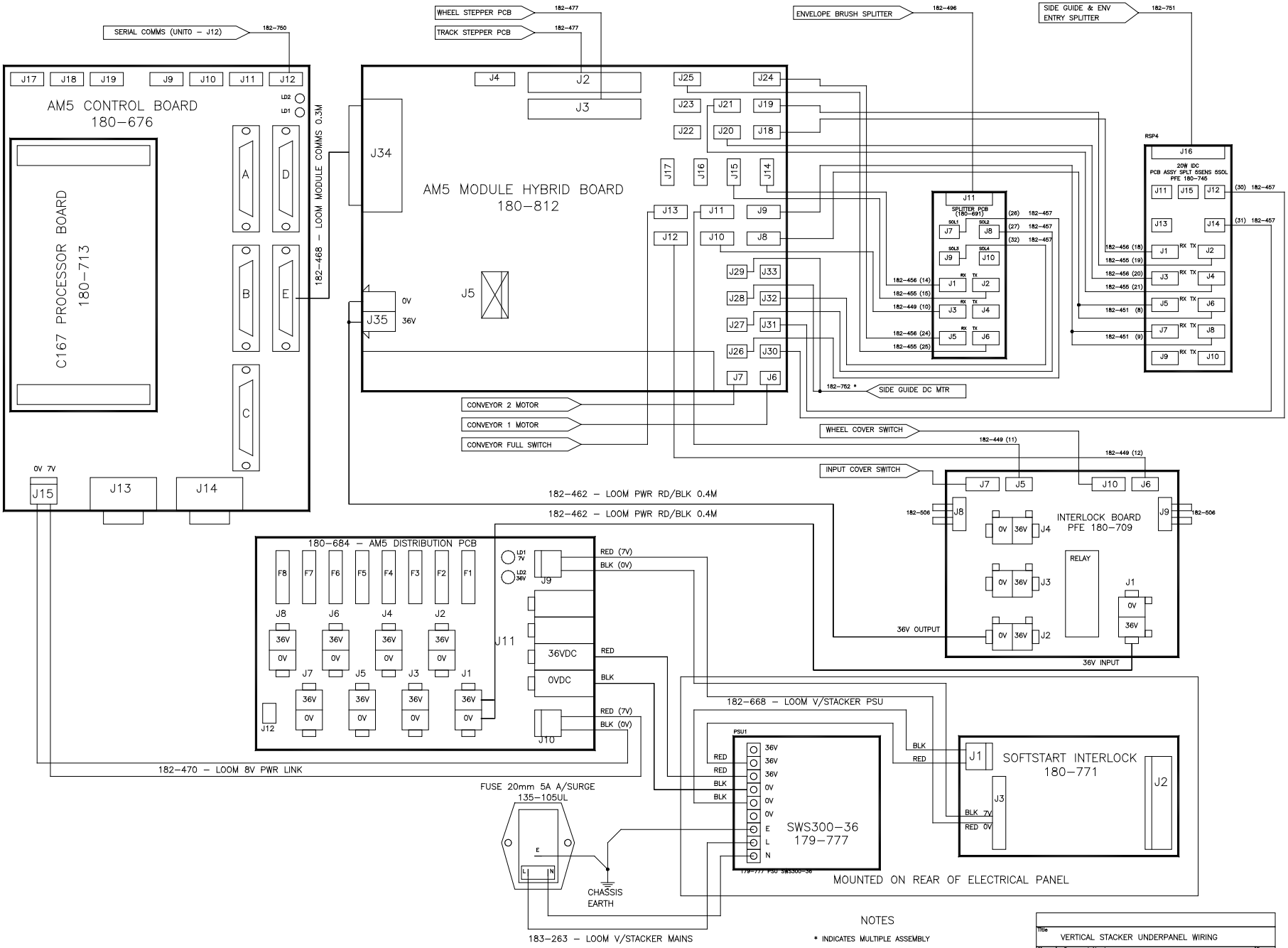
5.47 - Single On-line Interface Wiring Diagram



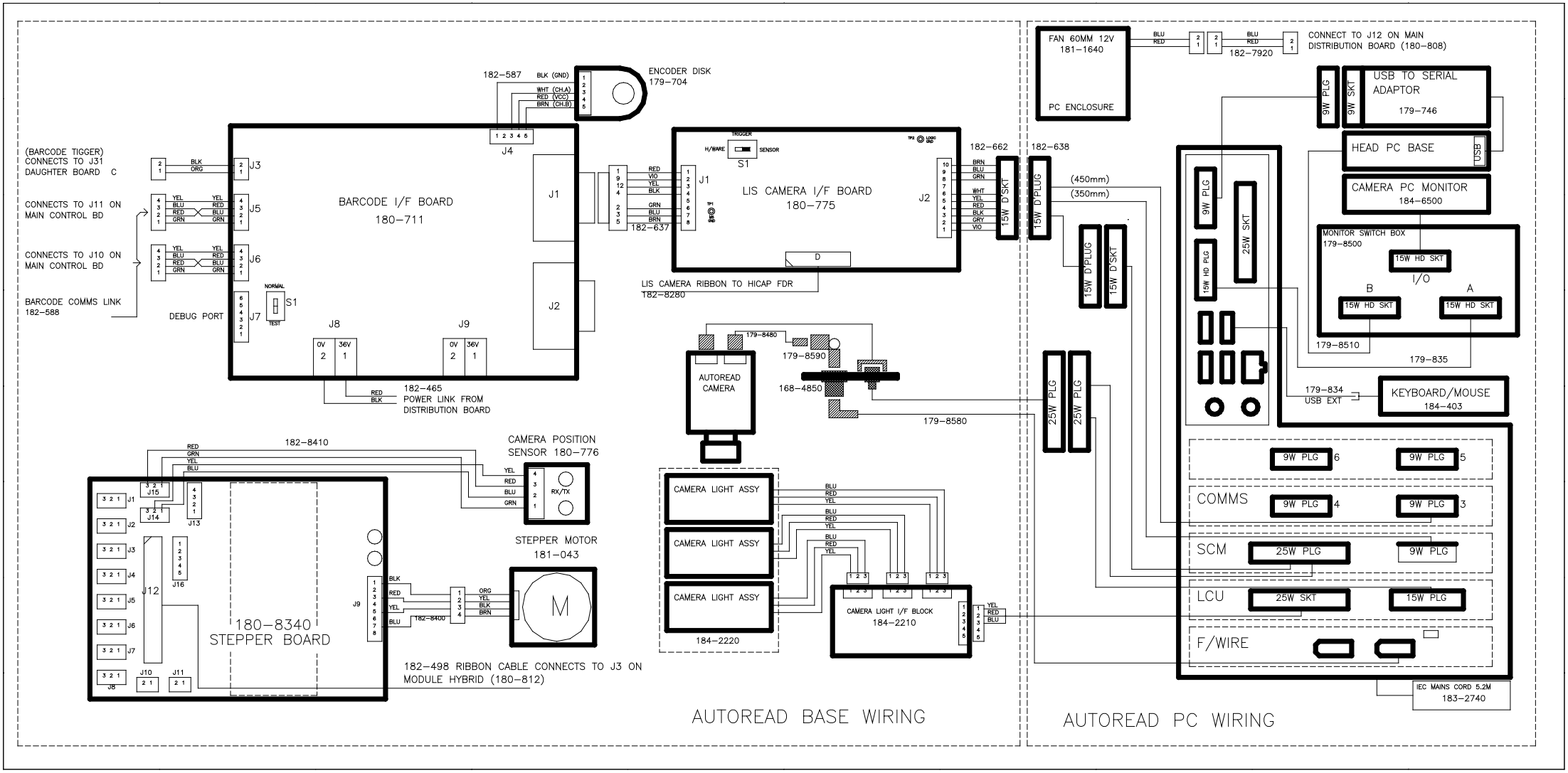
5.48 - Flatbed Feeder Wiring Diagram



5.49 - Vertical Stacker (Main) Wiring Diagram

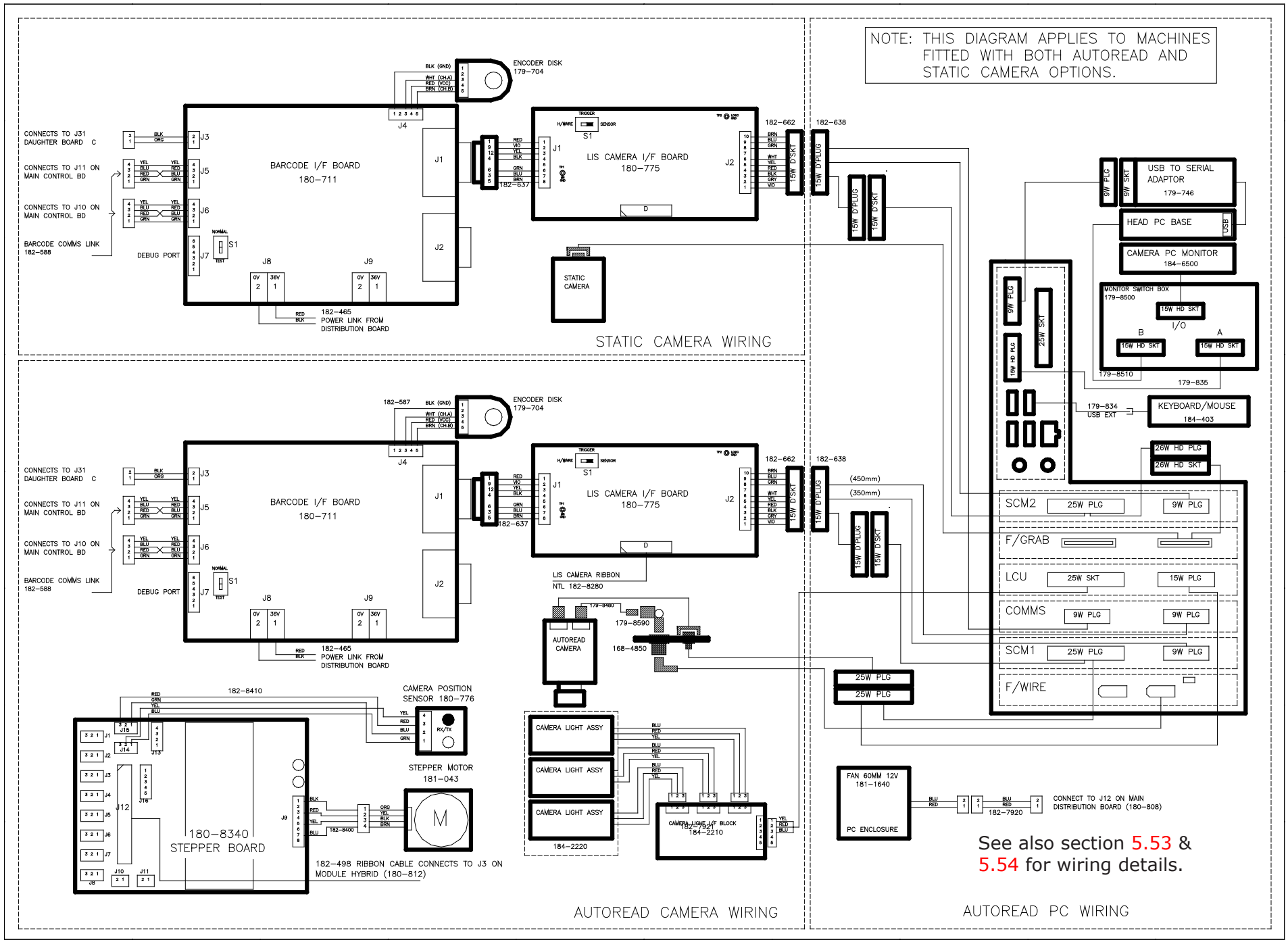


5.50 - Vertical Stacker (Underpanel) Wiring Diagram

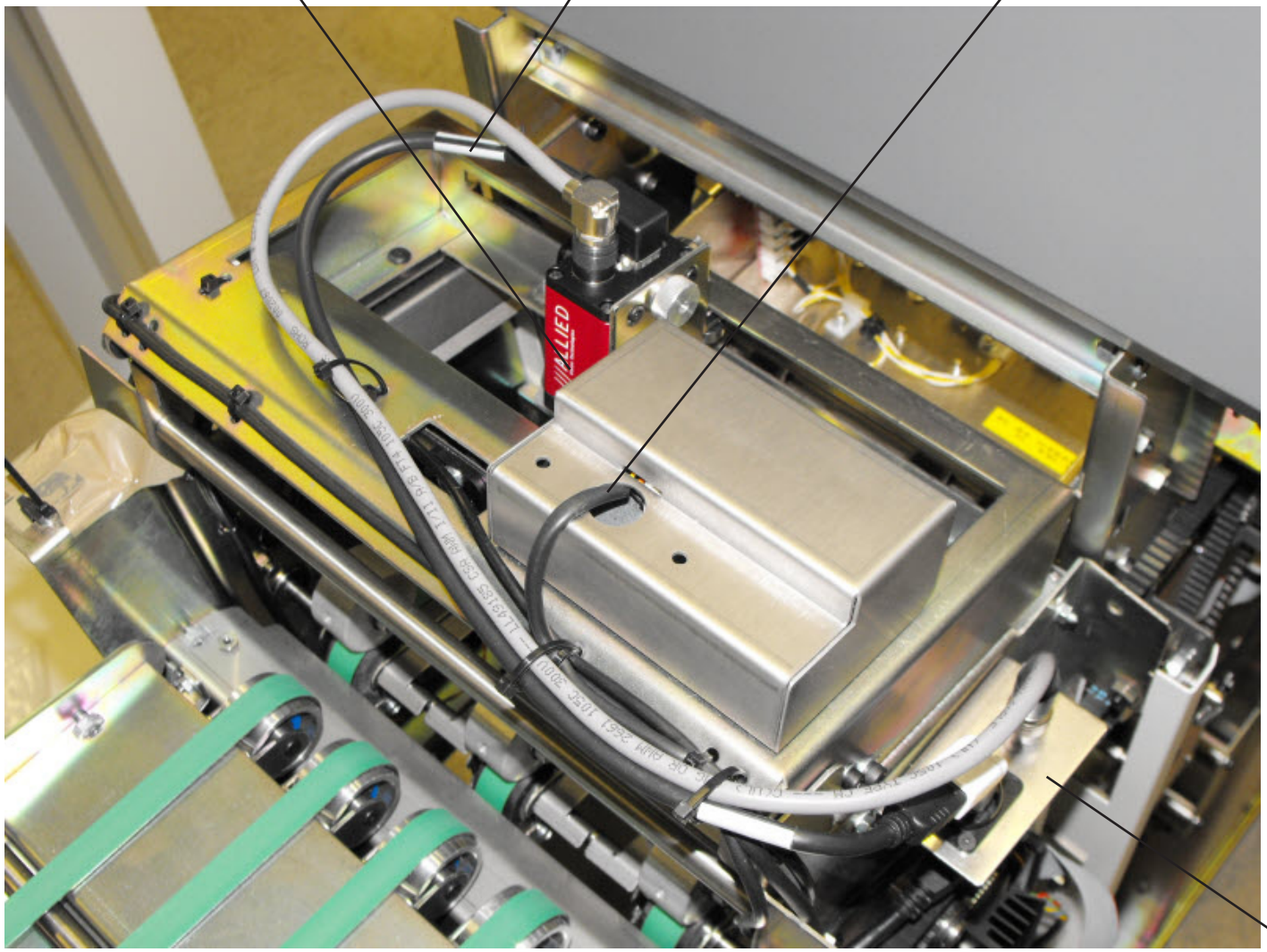


See also section 5.53 & 5.54 for wiring details.

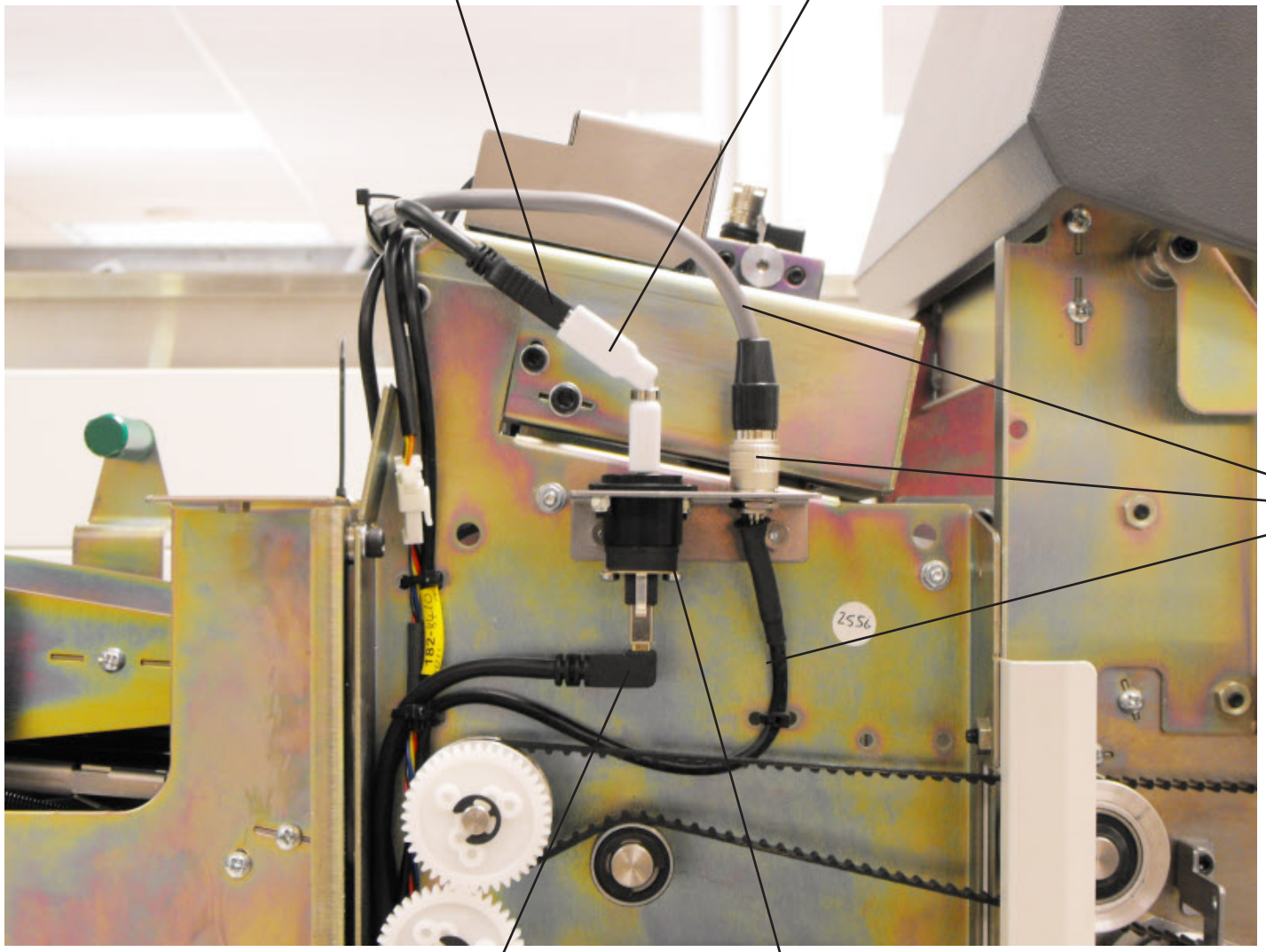
5.51 - Autoread Camera Wiring Diagram



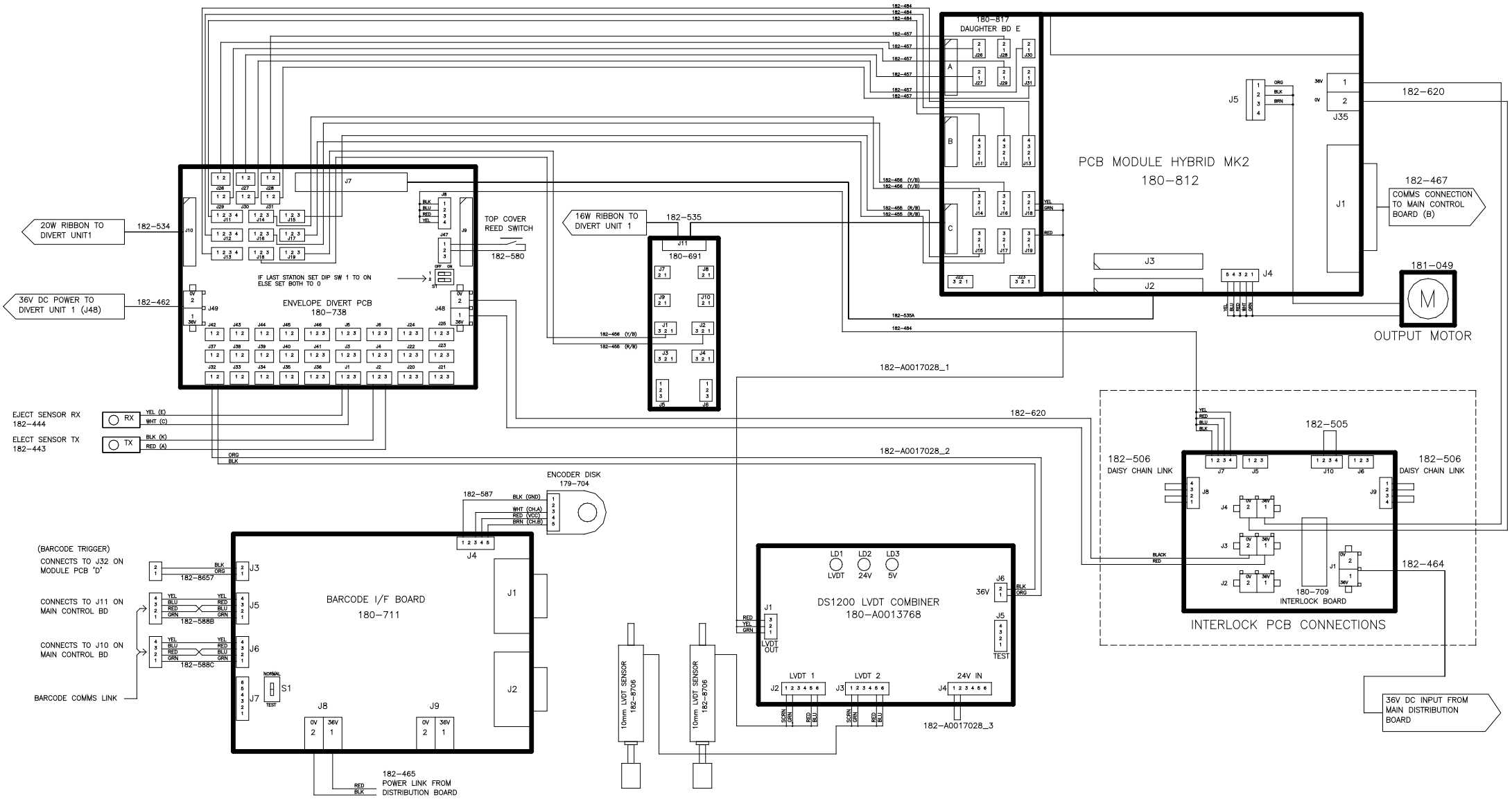
5.52 - Autoread Camera + Static Camera Wiring Diagram



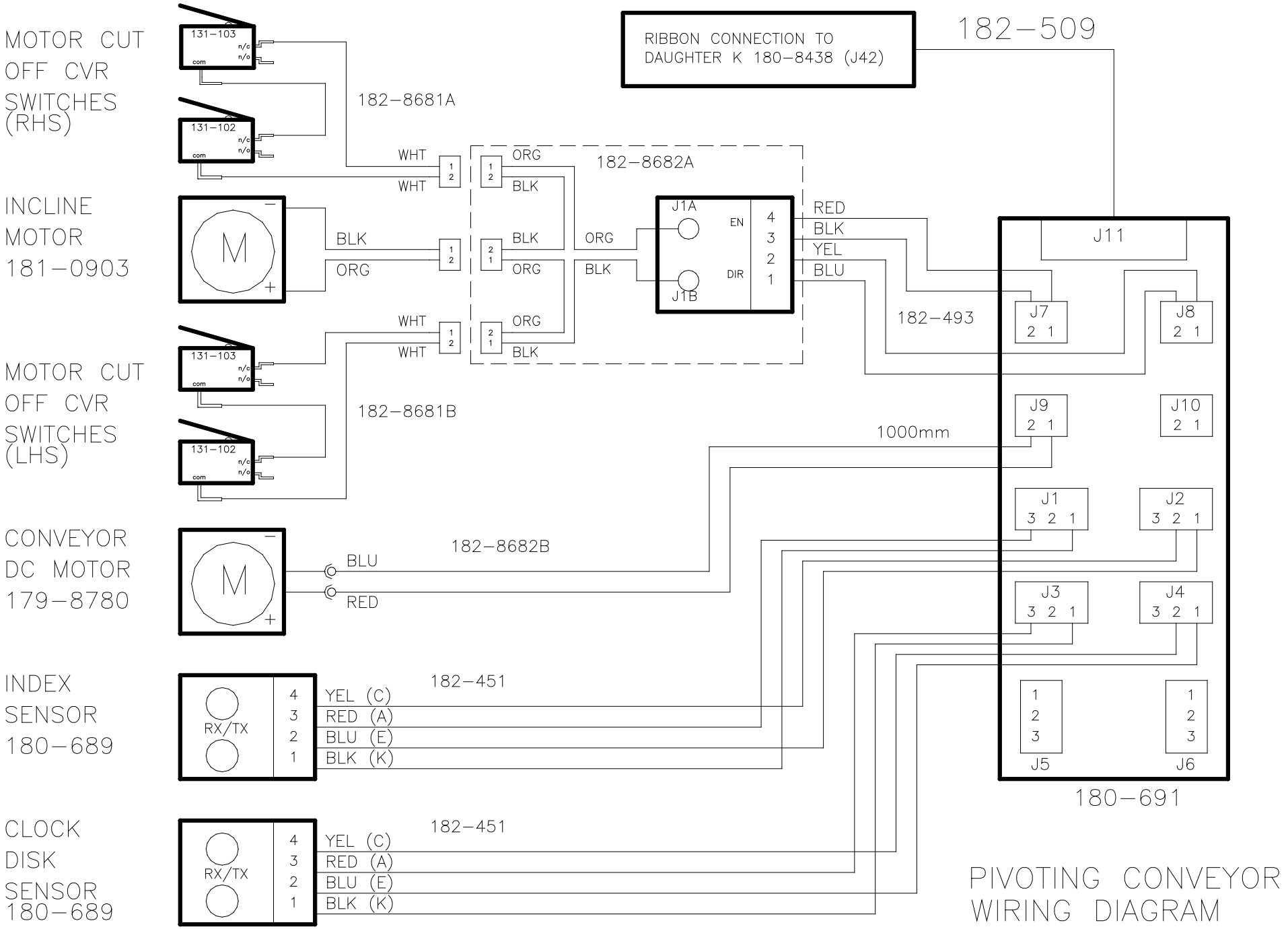
5.53 - Autoread Wiring 1



5.54 - Autoread Wiring 2



5.55 - Dual Output Thickness Checker - Wiring Diagram V2



5.56 - Pivoting Conveyor Wiring Diagram

5.57 MAINS DISTRIBUTION (see also diagram overleaf)

Mains power for the 1200-*G3* is distributed from DIN rail connectors located behind the head unit, under the envelope opener. Incoming mains power is delivered to a mains switch located behind the insert head. Output from the mains switch then connects through 30A fuses to a number of 10A fuses for connection to the insert head (unit 0) and station pairs (units 1 & 2, 3 & 4 etc.). If a greater number of stations than 12 is fitted, an add-on DIN rail is fitted to provide further fused outputs. **Important:** Although all 10A fuses are isolated by turning off the mains switch, **power to the PC is not:** this is a separate supply that allows the PC to run for access to technical manuals and analysis tools, even when the main machine is isolated from the power source.

The fuse blocks supplying the DIN rail fuses are capable of carrying no more than 30A rated current (36A peak current). This means that dependent upon the number of stations, and the units fitted to them, not all configurations are possible without exceeding maximum rated current.

The chart on the opposite details current rating of each unit to ensure the maximum is not exceeded.

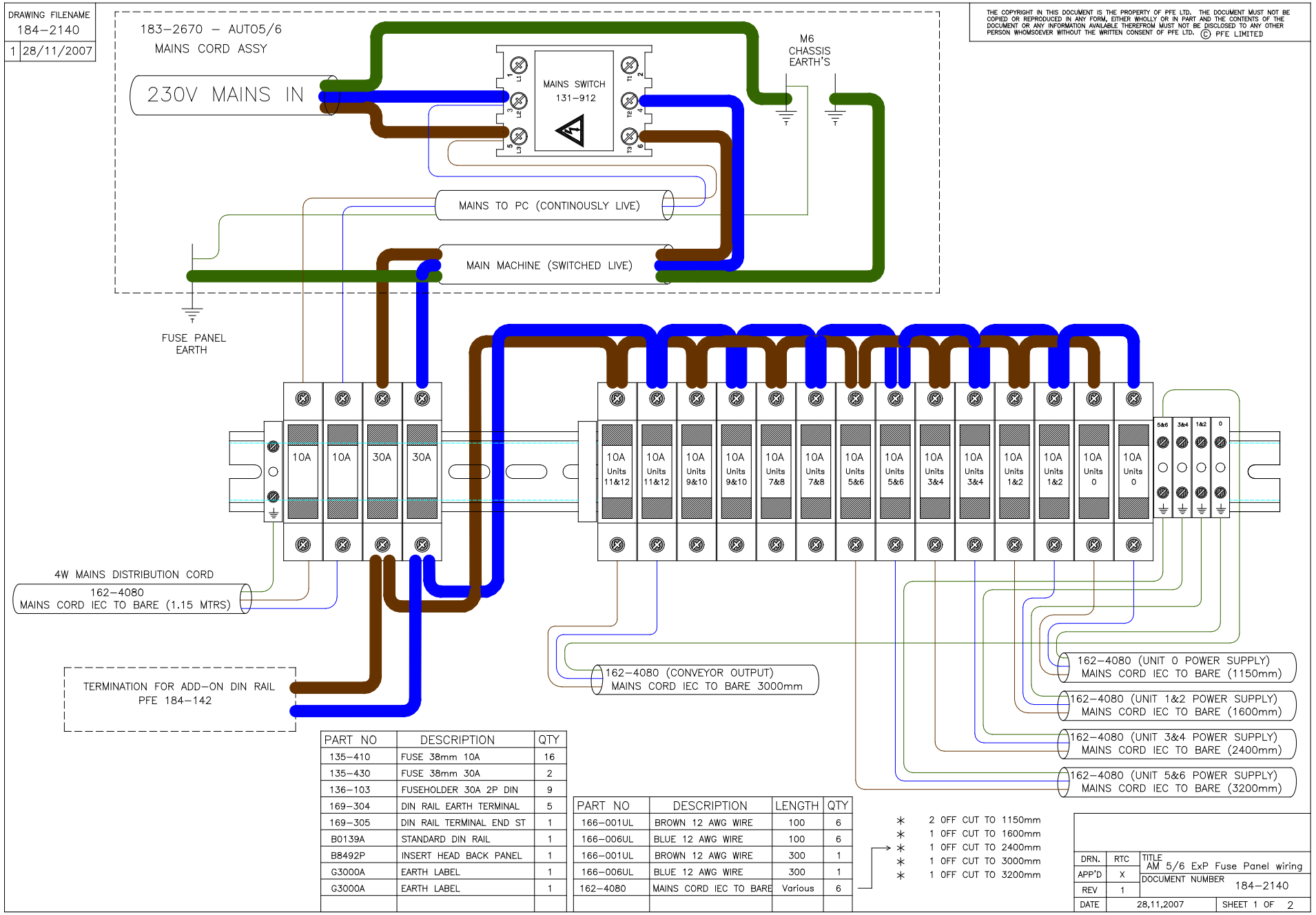
Note: the two end fuses on the main DIN rail are used by the conveyor, which uses approx. 200W. These fuses can also be used in parallel with another station unit, but observe the overall current rating.

RATED CURRENT		
UNIT DESCRIPTION	@115v	@230v
Head	6A	3A
Track Pair	2A	1A
Insert Feeder	2A	1A
Std-Cap Feeder Folder	2A	1A
Hi-Cap Feeder Folder	2.5A	1.25A
Std-Cap Accumulator[1]	4A	2A
Hi-Cap Accumulator[1]	5A	2.5A
Vertical Stacker	2A	1A
Typical Sytem Total[2]	25.5A	12.75A
Max. Allowable Rated Current	30A	30A
PEAK CURRENT		
Any System	Rated Current + 6A	Rated Current + 3A
Max. Peak Current	36A	33A

[1] Std-Cap/Hi-Cap Collator comprises:
- Collator Unit
- OMR/Barcode Reader
- Std-Cap/Hi-Cap Feeder Folder
- 2-Bin Divert

[2] Typical system (8 station) comprises:

		115v	230v
Head	Qty. 1	6A	3A
2 Stn. Module	Qty. 4	8A	4A
Feeder	Qty. 5	10A	5A
Std-Cap Folder	Qty. 1	2A	1A
Hi-Cap Folder	Qty. 1	2.5A	1.25A
Hi-Cap Collator	Qty 1	5A	2.5A
		33.5A	14.3A


DRAWING FILENAME
184–2140
1 28/11/2007
183–2670 – AUTO5/6
MAINS CORD ASSY
230V MAINS IN
MAINS SWITCH
131–912
M6
CHASSIS
EARTH'S
MAINS TO PC (CONTINOUSLY LIVE)
MAIN MACHINE (SWITCHED LIVE)
FUSE PANEL
EARTH
10A
10A
30A
30A
10A Units 11&12
10A Units 11&12
10A Units 9&10
10A Units 9&10
10A Units 7&8
10A Units 7&8
10A Units 5&6
10A Units 5&6
10A Units 3&4
10A Units 3&4
10A Units 1&2
10A Units 1&2
10A Units 0
10A Units 0
5&6
3&4
1&2
0
4W MAINS DISTRIBUTION CORD
162–4080
MAINS CORD IEC TO BARE (1.15 MTRS)
TERMINATION FOR ADD–ON DIN RAIL
PFE 184–142
162–4080 (CONVEYOR OUTPUT)
MAINS CORD IEC TO BARE 3000mm
162–4080 (UNIT 0 POWER SUPPLY)
MAINS CORD IEC TO BARE (1150mm)
162–4080 (UNIT 1&2 POWER SUPPLY)
MAINS CORD IEC TO BARE (1600mm)
162–4080 (UNIT 3&4 POWER SUPPLY)
MAINS CORD IEC TO BARE (2400mm)
162–4080 (UNIT 5&6 POWER SUPPLY)
MAINS CORD IEC TO BARE (3200mm)
THE COPYRIGHT IN THIS DOCUMENT IS THE PROPERTY OF PFE LTD. THE DOCUMENT MUST NOT BE COPIED OR REPRODUCED IN ANY FORM, EITHER WHOLLY OR IN PART AND THE CONTENTS OF THE DOCUMENT OR ANY INFORMATION AVAILABLE THEREFROM MUST NOT BE DISCLOSED TO ANY OTHER PERSON WHOMSOEVER WITHOUT THE WRITTEN CONSENT OF PFE LTD. © PFE LIMITED
* 2 OFF CUT TO 1150mm
* 1 OFF CUT TO 1600mm
* 1 OFF CUT TO 2400mm
* 1 OFF CUT TO 3000mm
* 1 OFF CUT TO 3200mm
DRN. RTC
APP'D X
REV 1
DATE 28,11,2007
TITLE AM 5/6 ExP Fuse Panel wiring
DOCUMENT NUMBER 184–2140
SHEET 1 OF 2

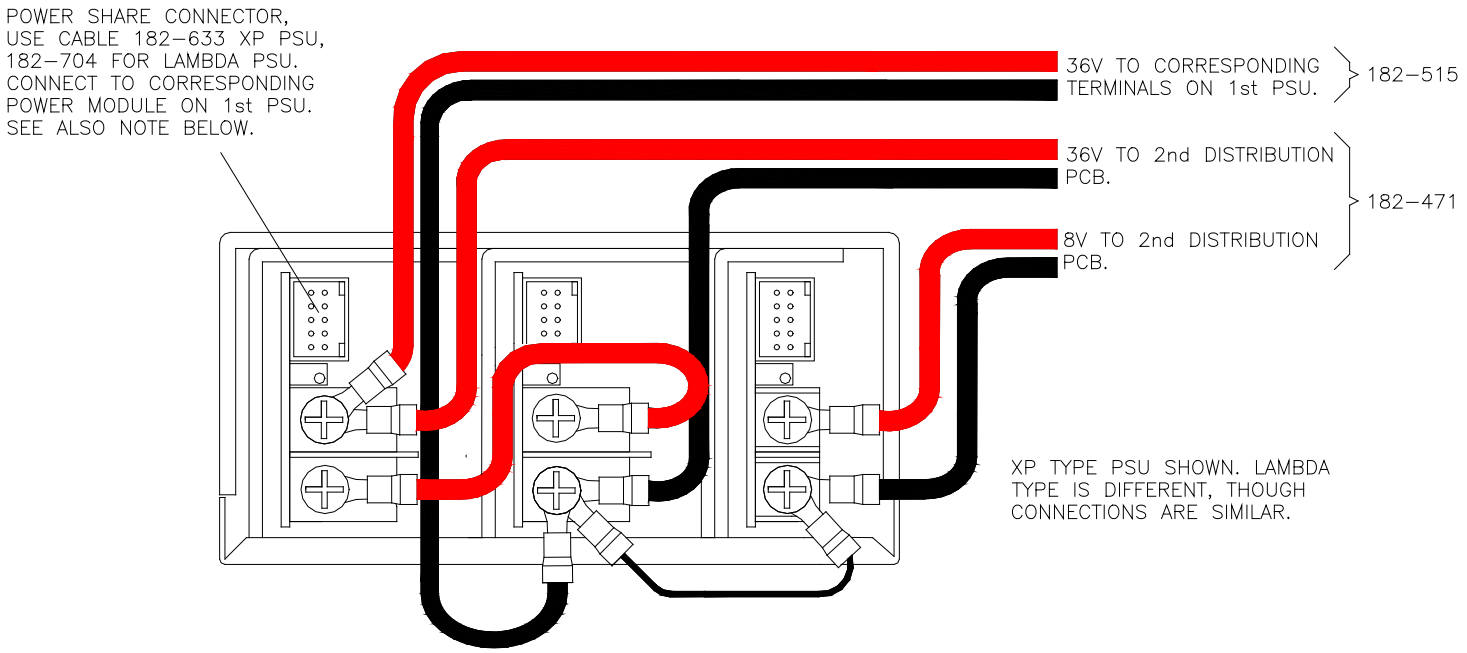
PART NO	DESCRIPTION	QTY
135–410	FUSE 38mm 10A	16
135–430	FUSE 38mm 30A	2
136–103	FUSEHOLDER 30A 2P DIN	9
169–304	DIN RAIL EARTH TERMINAL	5
169–305	DIN RAIL TERMINAL END ST	1
B0139A	STANDARD DIN RAIL	1
B8492P	INSERT HEAD BACK PANEL	1
G3000A	EARTH LABEL	1
G3000A	EARTH LABEL	1

PART NO	DESCRIPTION	LENGTH	QTY
166–001UL	BROWN 12 AWG WIRE	100	6
166–006UL	BLUE 12 AWG WIRE	100	6
166–001UL	BROWN 12 AWG WIRE	300	1
166–006UL	BLUE 12 AWG WIRE	300	1
162–4080	MAINS CORD IEC TO BARE	Various	6

Fig. 3 - Mains DIN Rail

5.58 ADD-ON PSU

An add-on PSU 184-156 is required if a collator is fitted to any station, or if 2 Hi-Cap units are fitted together on the same station. A second Distribution PCB 180-684 is also required, and this is supplied in the kit. The PSU mounts on the rear of the electrical panel at the front of the station pair, the Distribution PCB mounts on the front of the panel.


POWER SHARE CONNECTOR, USE CABLE 182–633 XP PSU, 182–704 FOR LAMBDA PSU. CONNECT TO CORRESPONDING POWER MODULE ON 1st PSU. SEE ALSO NOTE BELOW.
36V TO CORRESPONDING TERMINALS ON 1st PSU.
182–515
36V TO 2nd DISTRIBUTION PCB.
8V TO 2nd DISTRIBUTION PCB.
182–471
XP TYPE PSU SHOWN. LAMBDA TYPE IS DIFFERENT, THOUGH CONNECTIONS ARE SIMILAR.

Note:

2 Types of PSU are available, Lambda and XP. They cannot be combined, so if an add-on kit is required for a field upgrade, the type already fitted must be specified. The power-share cable is also different - 182-704 is required for Lambda, 182-633 for XP.

5.59 COMPUTER EQUIPMENT

The 1200 G3 uses a standard PC for running software and storage of technical information, datalog files, archives and other associated software, eg. PICS Integrity Checking System. A touch-screen LCD monitor is used in conjunction with the PC, 17” up to late 2006, 19” after this date.

CAN Hardware

Software versions up to Version 5 used a PCI CAN (Computer Area Network) device inside the PC. Version 5 onwards allows the use of a USB CAN instead, and was fitted to production machines from this version onwards. If a replacement CAN is required from a PCI machine, a procedure ‘USB CAN Setup.pdf’ exists on the PC in the Technical Documentation directory, describing the procedure for installing and setting up the CAN. A different terminator is fitted to the USB device, conncted between the CAN and the cable to the Control PCB on the electrical panel at the front of the inserter head.

Remote Control

If a hand-held transmitter is replaced, or other communication failure occurs, it must be retuned to the receiver (mounted inside the machine, in front of the PC. To do this:

1. Lift the receiver out of the machine after removing the bracket (do not disconnect the cable).
2. Remove the receiver cover and press SW2 to illimunate the Red LED.
3. Press a switch on the hand-held TX once and the LED will flash twice then extinguish. Press a switch again and the LED will flash. When the flashing has stopped, the TX and RX are in tune.

Equipment Item Numbers

184-642	Computer A5 ATX
184-650	ELO 1915L Touchmonitor
184-645	Wireless Keyboard & Mouse
184-6990	Remote Control Assy Viper*
179-A0008176	Startech 4 Port PCI Card
179-781	Sub D9 CAN Terminator

* Includes, TX, RX and mounting bracket. Spare control panel overlays can be obtained by ordering G3-0547-A for 184-6990.